

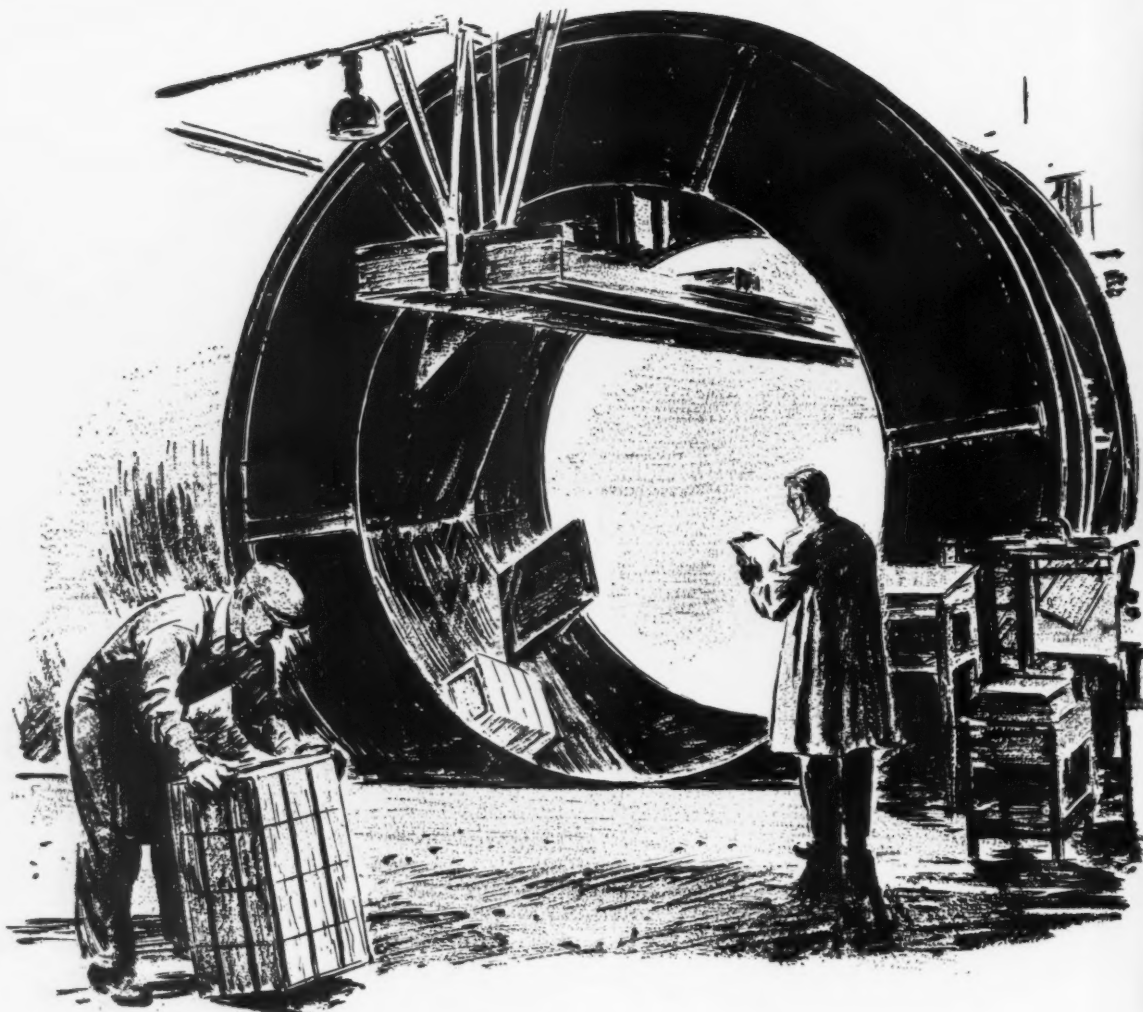
WESTERN INDUSTRY



One accurate shop estimate can be
worth 1,000 guesses . . . page 33

To know when and how you should
paint plywood . . . see page 36

NOVEMBER 1951



Leaders in pole line hardware industry have standardized on Cabco wirebound boxes for bulk shipments of heavy hardware, castings, forgings. One firm ships 75 lbs. of bolts in Cabco wirebounds weighing 4 lbs. Shippers realize up to 50% savings on container weights with light, strong Cabco wirebounds.

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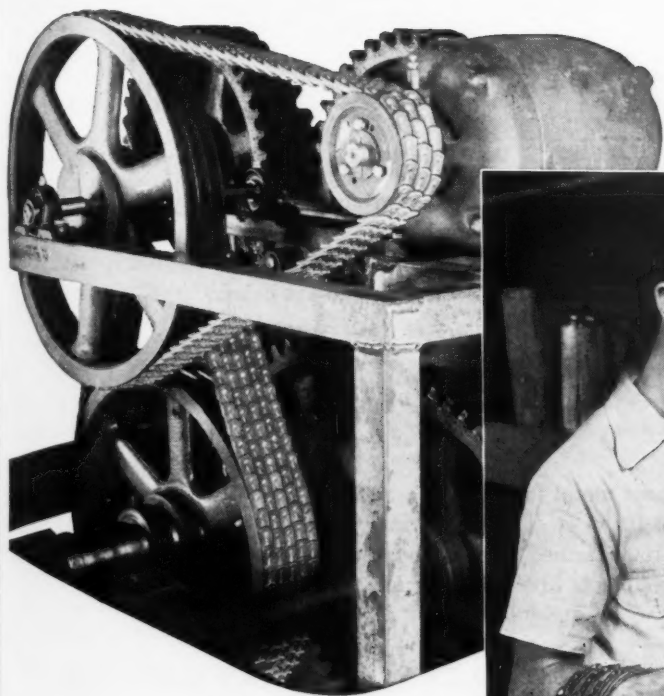
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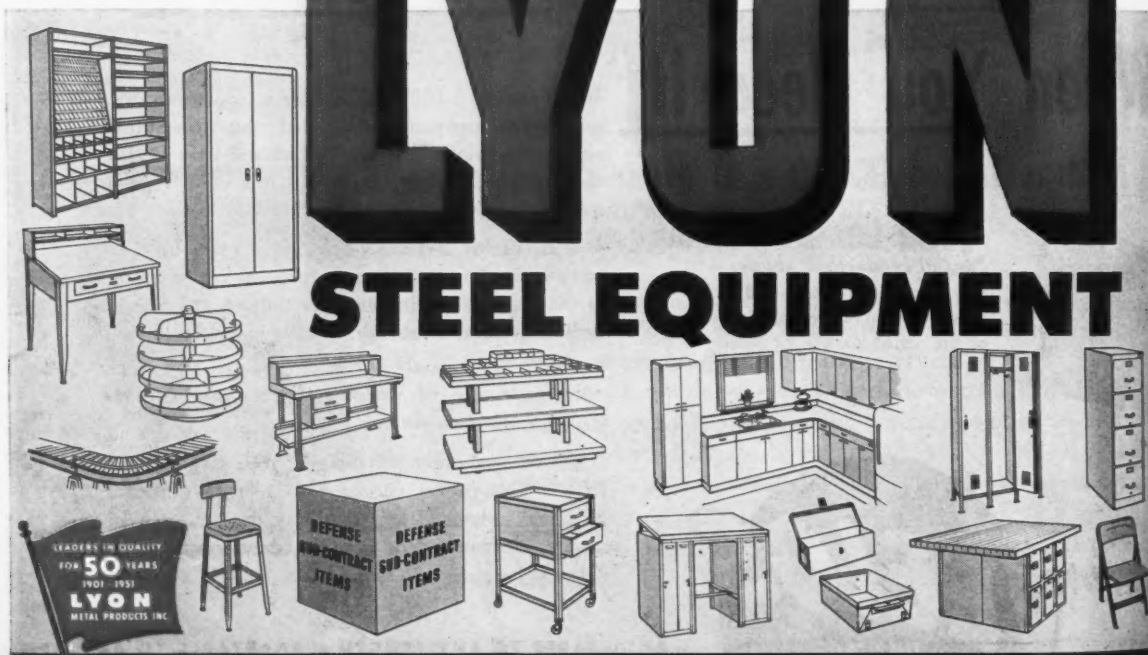
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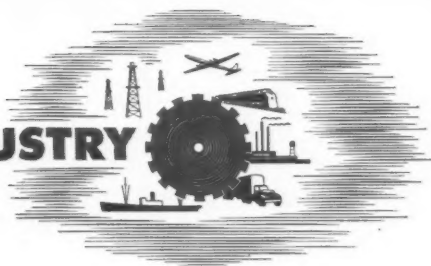


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WESTERN INDUSTRY



VOLUME XVI

NOVEMBER • 1951

NUMBER 11

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FRONT COVER

One fundamental Western industrial attitude is the never-ceasing search for tools to do the job better and faster. Here is Fred Wells at Menasco Mfg. Co., Burbank, testing the capacity of a new toolholder on a precision turning job. This attitude and these tools are components of effective Western competition.

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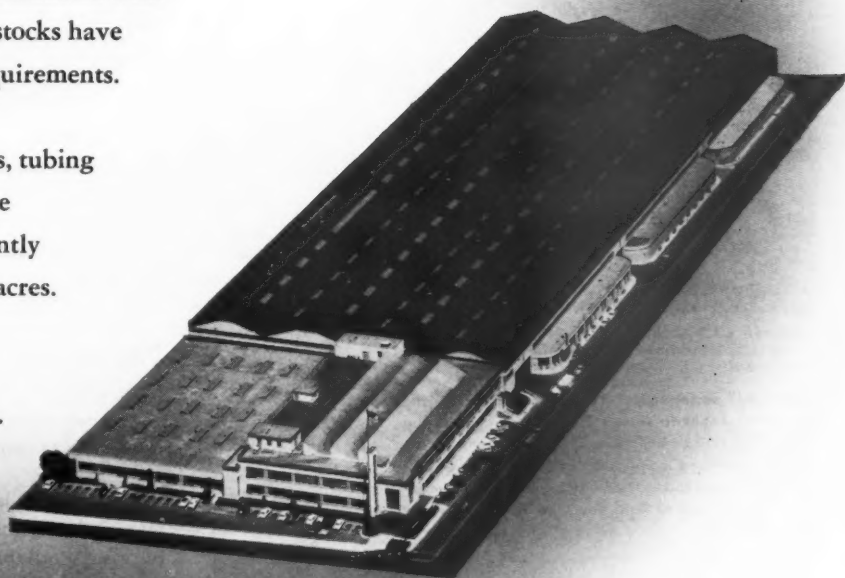
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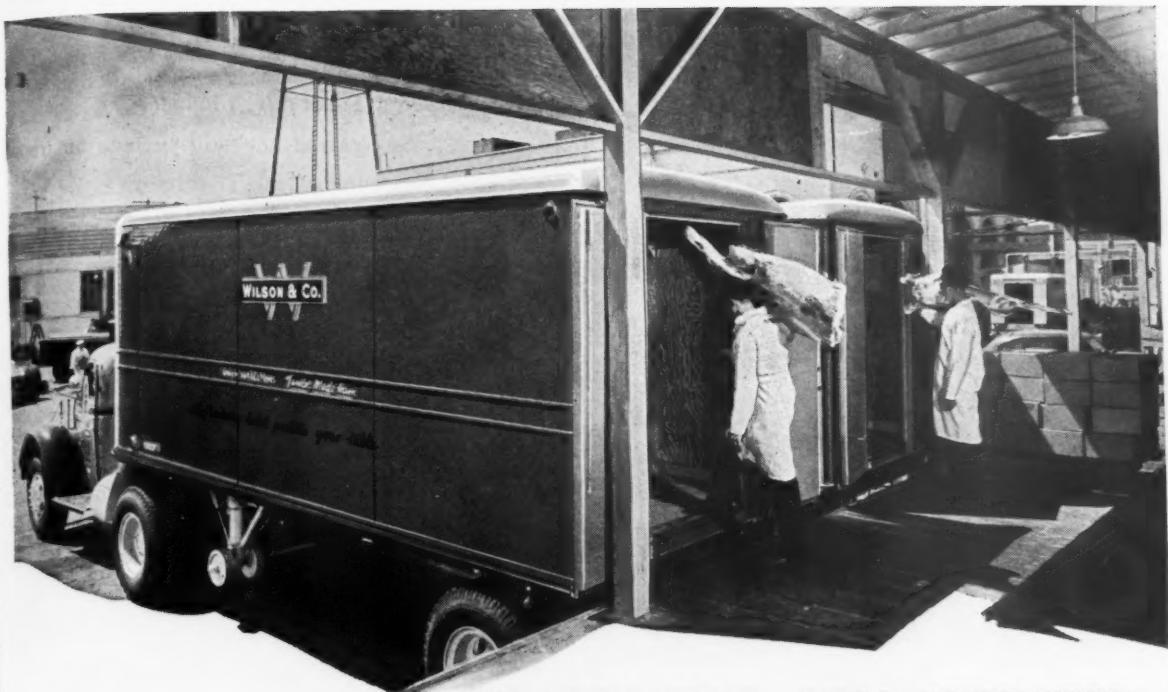
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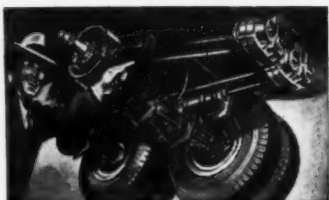
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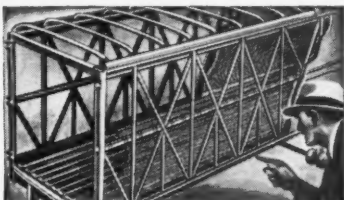
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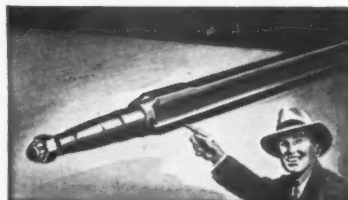
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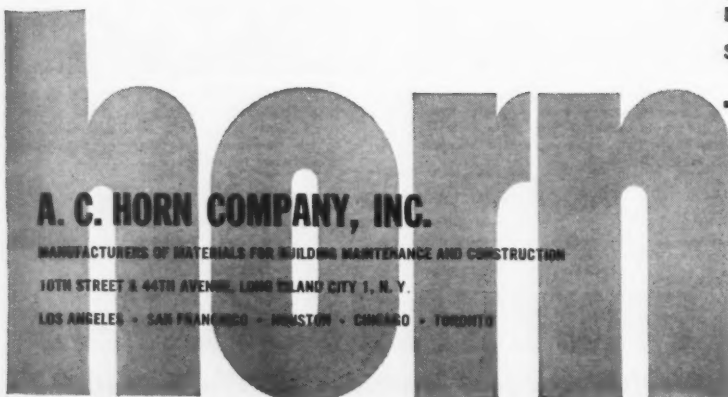


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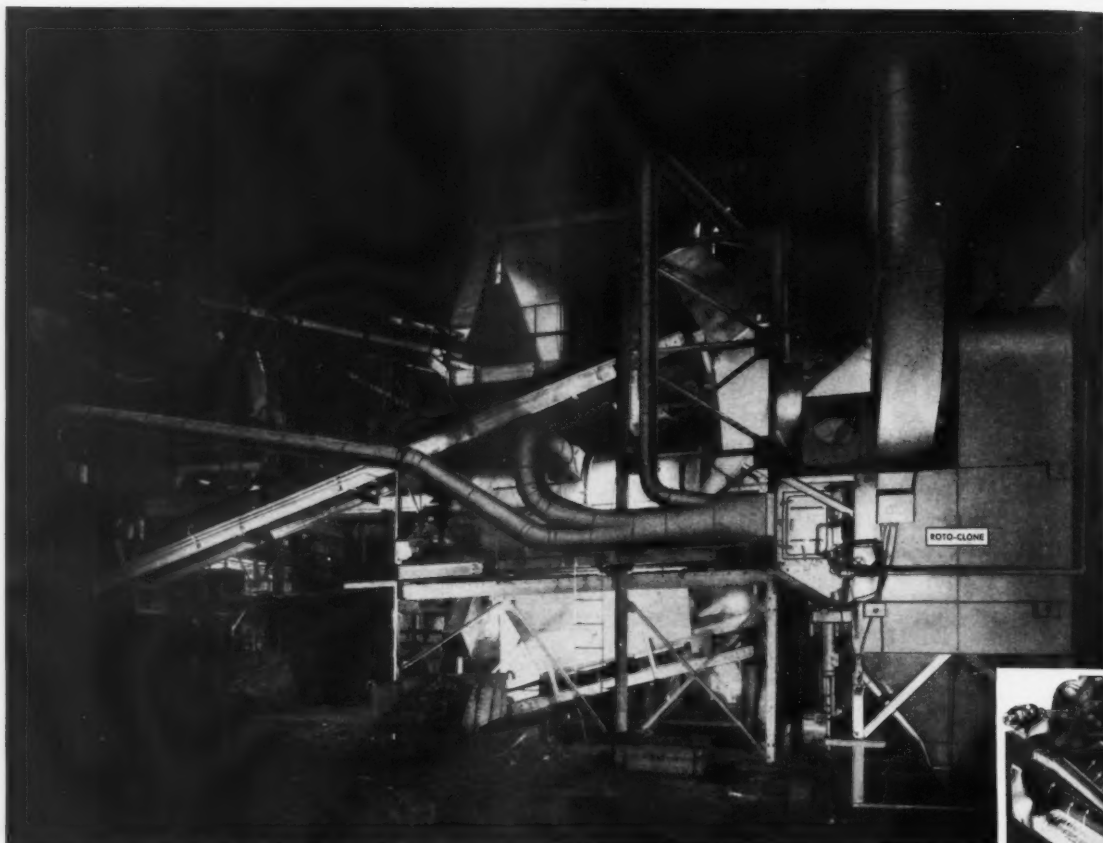
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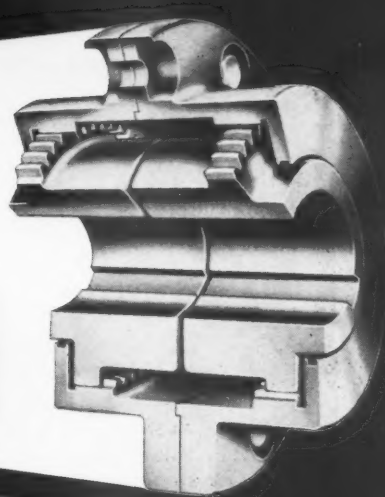


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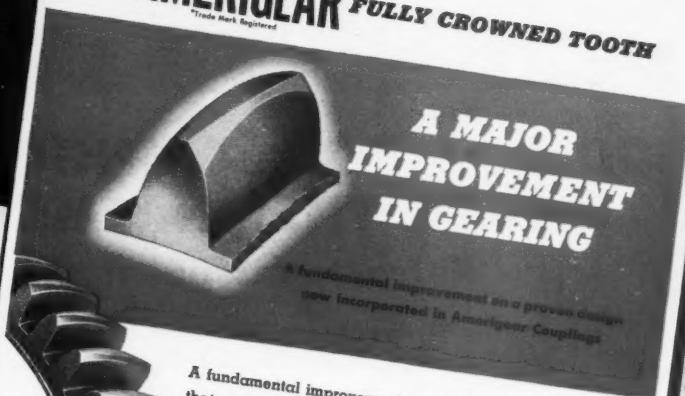
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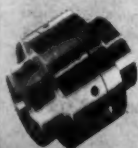
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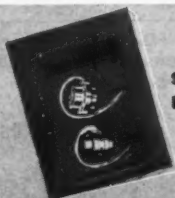
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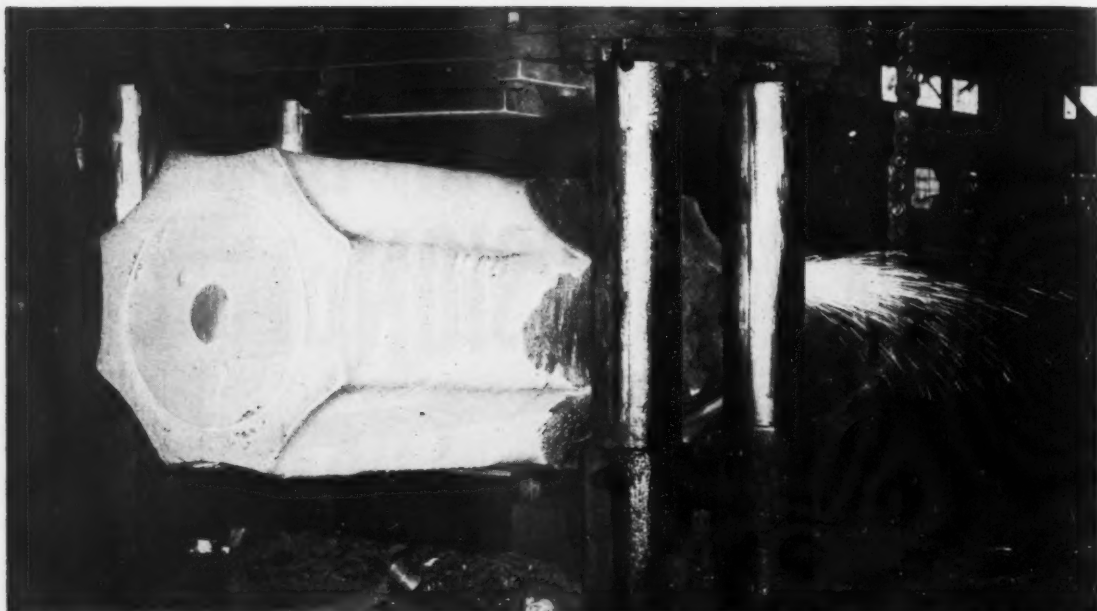
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Manufacturers of the
Original "Oldham Type"
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100,000 POUND INGOT UNDER THE HAMMER

Refractories put it there

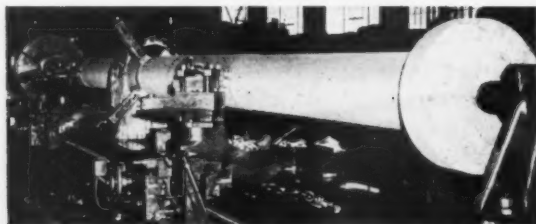
Isaacson Iron Works of Seattle, Washington, is pouring and forging 50-ton ingots, the largest standard production ingots on the West Coast. A new and larger forge furnace had to be built to handle these giants. Gladding, McBean & Co. Super Duty Firebrick were used exclusively in this new furnace. GMcB refractories also line the giant pouring ladles, ingot mold extensions and 30 other forge furnaces in this plant.

Throughout the West, industrial producers like Isaacson Iron Works, have come to rely on the quality refractories made locally by Gladding, McBean & Co. Regardless of your refractories needs or problems, Gladding, McBean & Co. can be of service to you.

This 1500-ton steam-hydraulic press shapes the giant ingot into rough shaft for the final machining operation.



Giant 50-ton ingot is removed from the forge furnace at the end of the re-heating cycle. GMcB firebrick built the furnace.



Niles 60' x 60" lathe with double carriage machines forged ingot into tail shaft for a P-2 transport vessel.



Teeming the ingot. Molten steel pours from the bottom of the ladle into the ingot mold. GMcB standard and special firebrick line ladle and mold extensions.

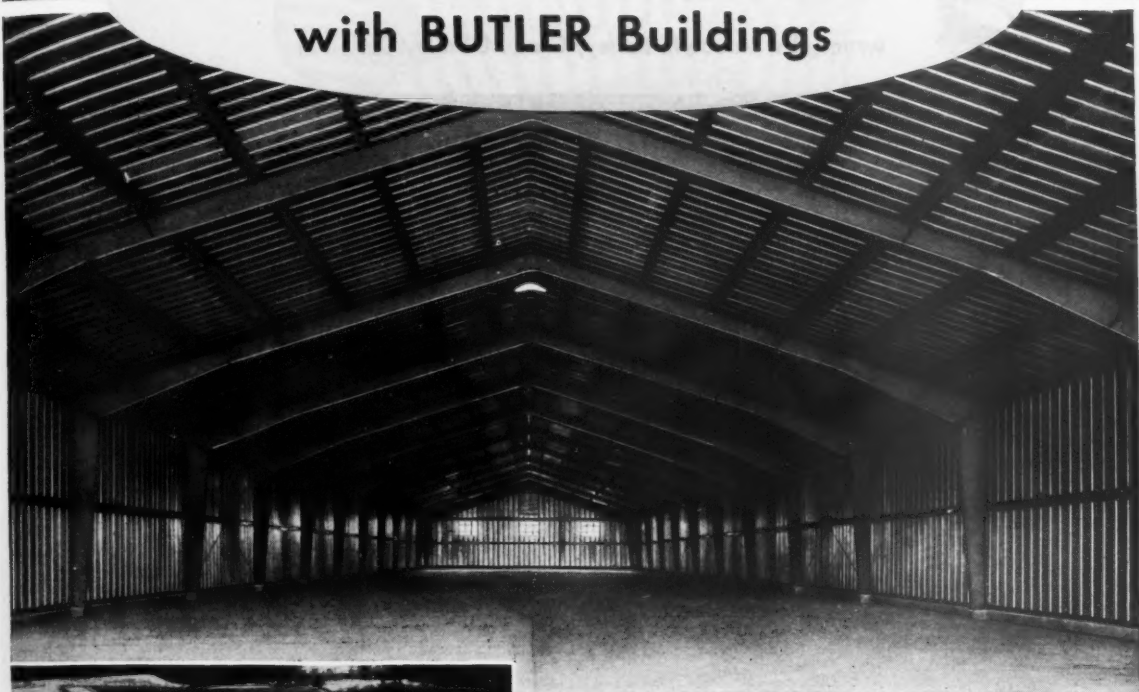


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Refractories, made in the West for Western Industries—Fireclay Brick for all classes of service, Plastic Firebrick, Castable Refractories, Silica Brick, Chrome and Magnesite Brick and Specialties, Wet and Dry Refractory Mortar—air and heat setting, Refractory Coatings, Ground Fireclay and Grog.

6301

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Twelve Butler Buildings at Military, Kansas, provide storage space for 15,000 tons of sacked ammonium nitrate. Each building is 42' x 260' x 10'.

When space is needed in a hurry, choose Butler Steel Buildings—for fast expansion of existing facilities or new building construction.

Butler Buildings offer Western industry these special advantages: (1) lower initial cost (save 33 to 50 per cent over cost of conventional construction); (2) easily erected with less labor; (3) ready for use in days instead of weeks; (4) long-life, bolted construction, yet easy to dismantle and move to new locations; (5) fire-safe (low insurance rates); (6) weathertight, wind-resistant; (7) easily adapted to practically any industrial need; (8) low maintenance; (9) wide range of sizes.

Butler Buildings are made at our Richmond, Calif., plant, for convenient delivery to West Coast industry . . . and have been proved in use for more than 40 years. For information on how Butler Buildings can meet your needs—at a savings to you—see your Butler distributor, or mail coupon below today.

Straight Sidewalls . . . Use All the Space You Pay For



**BUTLER MANUFACTURING
COMPANY**

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Galesburg, Ill. Birmingham, Ala.
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For prompt reply, address Butler Manufacturing Co., Dept. WI 211, Richmond, Calif.

☐ Send full information about Butler Buildings, for use as _____

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Name _____

Firm _____

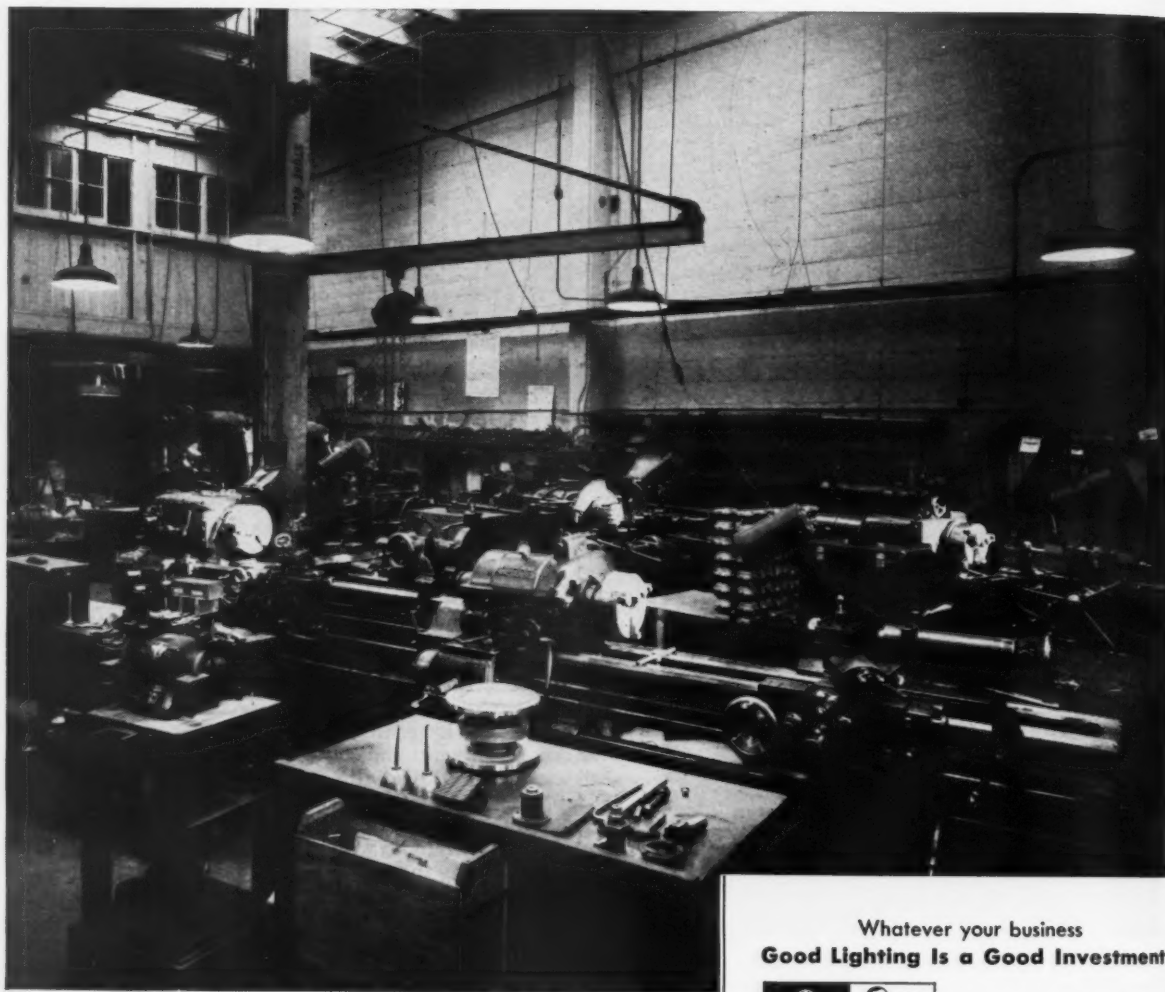
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"Planned lighting gave us as much as 15% production increase..."

writes Mrs. Maude R. Bailey; Chas. M. Bailey Co.



Spotlights mounted on each machine give intense light for easy vision at critical tool point

Does planned lighting pay? The Chas. M. Bailey Co. of San Francisco writes: "... after the installation of the new lighting system we were very pleased, and feel quite positive it made as much as 15% increase in our production.

"The best recommendation for the new lighting was by one of our skilled mechanics, who stated: 'Before the new lights were installed, nobody wanted to work the night shift even for a premium. Now we all like to.'"

P·G·and·E·

PACIFIC GAS AND ELECTRIC COMPANY

Whatever your business
Good Lighting Is a Good Investment



Increases production, sales

Reduces waste



Keeps employees happy, efficient

Reduces accidents



Increases cleanliness

For a survey of your lighting and ideas on how better lighting can help you, call the lighting engineer at your P. G. and E. office, or consult your contractor or engineer.



Photo by Clarisse

Got Traffic Troubles, Mister?

That's tough. But if they have to do with getting a shipment safely somewhere at a certain time . . . and keeping track of it along the way, let's hear about it. That's where dependable delivery and our reliable tracing system meet the situation.

Maybe it's a question of routing or of proper protection for perishables. Whatever it is, it's our job

to help you. That's why we have trained traffic men from coast to coast.

We want you to think of Union Pacific as more than just a carrier. Think of us as part of your organization ready with information and suggestions to help you with traffic problems. Call in your nearest U. P. freight representative at any time.

Be Specific - Ship "Union Pacific"

(Offices in 70 cities throughout the U. S. A.)



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WHITE 3000

**...does more work
...in less time
...at less cost**

Graham Brothers, famous for split-second efficiency in supplying Grahamixed concrete, takes advantage of White's new 3000 design which permits far greater legal capacity than is possible on conventional trucks of similar wheelbase.

Extra Carrying Capacity... extra capacity for work—solid reasons for the sensational performance of White's 3000 on rugged construction jobs! This *new idea* in motor transportation means timesaving maneuverability and money-saving ease of maintenance. It will pay you to investigate—to get the facts of White. See for yourself how the 3000 design permits greater payload, makes better time through traffic, moves

quickly in and out of spots that stymie ordinary trucks! Your local White representative is ready to demonstrate the 3000's superiority—in terms of *your* operation. Why not plan to give him a call today?

**WHITE 3000's PROVED
COST-SAVING ADVANTAGES**

1. Saves driver time and energy
...gets more work done.
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cuts maintenance costs.
Makes service easier.
3. New safety features.
4. New weight distribution permits
longer bodies...more payload.
5. Saves space on the street...in the
garage...better maneuverability.

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WHITES in
BEST WORKING
CONDITION



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FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS



LARGE SIZE a specialty..

at NATIONAL SUPPLY

SLAG POT STAND sections shown above weigh 17,000 and 22,000 pounds, and were cast, heat treated and machined in the 38-acre Torrance, California, plant of The National Supply Company. They are typical examples of the big jobs handled easily in National's Torrance Plant.

We are prepared to fabricate heavy parts to precision tolerances. Our facilities include:

- Steel Plant
- Steel Foundry
- Forging Departments
- Quality Control Laboratory
- Machining Departments
- Welding Departments
- Heat Treating Departments
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Tell us about your next heavy fabrication job. To acquaint yourself with our plant, write for your free copy of "From Melting Furnace to Finished Product." Address Department 211.



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THE NATIONAL SUPPLY COMPANY

INDUSTRIAL PRODUCTS DIVISION

TORRANCE, CALIFORNIA • LOS ANGELES AREA

EDITORIAL COMMENT

Signs of Sanity

FOR TOP HONORS in the "me first" contest, we do not know which of the eleven Western States to recommend. All eleven of them might cross the tape at the same time.

But there are signs of a trend toward the state of thought prevailing in the West in the latter part of the war and the earliest postwar period, that the entire region had some things in common which were worth discussing and perhaps fighting for.

The Central Coast Council of the California State Chamber of Commerce, at its meeting in San Francisco, September 21 last, approved a recommendation of the industrial committee that the chamber appoint a committee representative of industrial development agencies and of both rural and metropolitan areas of commerce to explore the desirability of organizing a tri-state council, composed of industrial development leaders from California, Oregon and Washington to act as a unit on matters affecting industrial expansion on the West Coast.

It would have been still better to have included a few more of the Western States, but to get the tri-state council under way would itself be something notable. Even though its immediate object may only be to find a common ground in regard to defense contracts, far greater opportunities and responsibilities inevitably will be its portion.

Next?

AFTER SEVERAL YEARS of gagging, we have finally accepted* the word "brunch." Now comes Kenworth with the name "Bruck" for a combination bus and truck, which seems to forebode further snarling up of the English language. The plane that becomes an automobile after landing is threatened with being described as a "plauto," the plane that is also a helicopter is likely to become a "plalic" or a "heliane," and a combined radio-TV set a "teladio." That would almost justify a sale that was never confirmed being named a "cansale." But why quibble about such things? They say that if Niagara Falls were in England it would immediately be called "Niffles."

*Almost.

Boomerangs

IT IS GOOD to have the Postmaster General recommend that the post-office get out of the freight business by leaving the biggest and heaviest parcels to the express company. Business and industry will generally welcome any such signs of a trend away from paternalistic government. Too bad they fail to realize that they are often the worst offenders themselves in trying to get the government to perform special services for them.

Hammer Heads

"HE USUALLY hits the nail off the head enough to bend it." How would you like to have some newspaper reporter characterize you thus? It was one of the word-pictures describing the "five worst senators" in a contest among newspaper reporters covering the last Oregon legislature.

IN OUR MAILBOX

Specific Info . . .

Editor, *Western Industry*:

I have read Professor Keachie's article with great interest and believe that it is the kind of specific technical information which should be of real value to *Western Industry* readers.

L. M. HOLLAND, Manager
Industrial Department
San Francisco Chamber of
Commerce

* * *

. . . and Sound Thinking

Editor, *Western Industry*:

On reviewing Dr. Keachie's article "How Much to Spend for Plant Improvements" in the September issue, may I say that the material was very clearly presented and provided a basis for sound thinking in the establishment of the economics related to the purchasing of facilities.

E. L. SLAGLE
Works Industrial Engineer
Columbia Steel Company
Pittsburg, California

(Professor Keachie's article pointed out that old equipment may be costing more than anyone suspects, but there are a lot of ways in which the man who realizes this may get tripped up.)

* * *

Tops on Scrap

Editor, *Western Industry*:

Your story "How to Get Steel for Your Steel Plant" in the September issue of *Western Industry* is an outstanding article. It comes closer to being the kind of story that will get our scrap message across than anything we've seen yet.

May we reprint the article, giving full credit to your magazine, of course, to distribute to prospective scrap sources in the Rocky Mountain Region?

CHAS. E. BROKAW
Regional Director
STEPHAN H. ALEX
Regional Information Officer
U. S. Department of
Commerce
National Production Authority
Denver, Colorado

(The article "How to Get Steel for Your Plant—One Easy Lesson . . . Plus a Moral" was a deft reminder that the path to more steel lies right through the things in your plant that you ought to turn in for scrap.)

* * *

Aid to Distributors

Editor, *Western Industry*:

I have just read the May issue of your publication and noticed with great interest your article entitled "The Western Industrial Distributor. Must Know More Than His Business."

Of course, I wish to convey my thanks for your having mentioned me as one who contributed in a small way to this article. But most of all, I wish to express my compliments to you on the finished product. This

Continued on page 28



Announcement

by Brainard Steel Company...

"We're here, and
we mean business..."

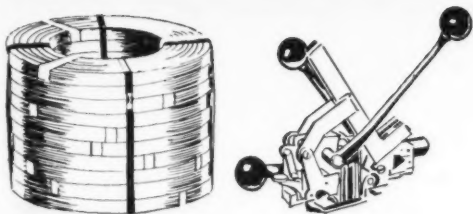
for steel strapping users"

★ Harry Hughes, manager of our newly opened San Francisco office and warehouse, is now in business for *service*—with Brainard's Steel Strapping System.

The Brainard Strapping System is used for securing packages, bundles, and carloads. Brainard offers over 1,000 kinds of strapping, tools, and accessories.

Brainard representatives like Harry Hughes know the application of these items inside out. They give personal attention to your packaging and shipping problems—to speed up your materials handling, and cut your costs.

Brainard's new West Coast Office is backed up by a warehouse to permit fast service. We've grown by giving *service*. Try us—our West Coast Office is at 717 Market St., San Francisco. Phone: Yukon 2-4667.



Brainard steel strapping protects against shipping damage, loss, and pilferage, also speeds materials handling. Brainard maintains continuous quality control throughout the manufacture of strapping, from ore to finished product.

—WANT FULL INFORMATION?—



WARREN, OHIO

Brainard Steel Company
717 Market Street
San Francisco, Calif.

Please send description and specifications of the Brainard Strapping System. I would like for (please check):

☐ Reference

☐ Immediate Planning

Your Name _____

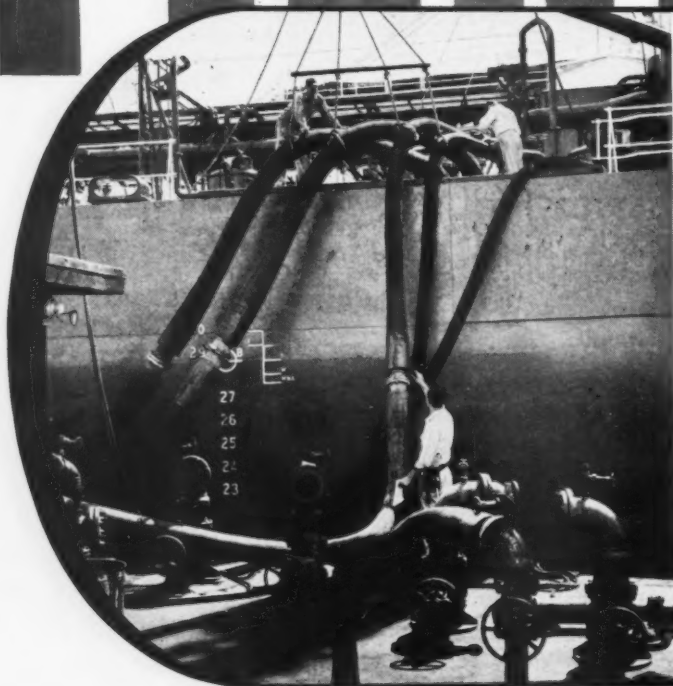
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Industrial rubber products especially built for LONG SERVICE

PIONEER



Cooperation

produced this
exceptional
oil hose

Standard of California tanker
being loaded through Pioneer Oil
Suction and Discharge Hose.

Most of America's best products spring from an interchange of ideas between the *user* and the *manufacturer*. Pioneer Oil Suction and Discharge Hose is the result of many years cooperation between engineering departments in the oil industry and our own laboratory and factories. This hose, as now used by Standard of California, for example, gives far longer service and helps speed tanker loading up to 20,000 barrels an hour!

Whether you want an industrial rubber product built to your specifications, or need the recommendation of experienced technicians, call on Pioneer Rubber Mills. Apply Pioneer's engineering experience and building facilities to

the industrial rubber products you use, and you will get the *extra* service that Pioneer customers know so well. Just call your nearest Pioneer representative.

"How to LENGTHEN the life of industrial rubber goods"

This booklet gives you hundreds of down-to-earth suggestions on how to get better service from all kinds of industrial rubber products. You'll profit from the subject matter, and you'll be amused by the colorful illustrations. Whether you are yet a Pioneer customer or not, just drop a post card asking for "Lengthen Life" booklet. Address: Pioneer Rubber Mills, 345-353 Sacramento Street, San Francisco 11, California.



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SPOKANE • BOISE • POCATELLO..... Intermountain Equipment Co.
SALT LAKE CITY..... National Equipment Co.
DENVER..... Western Belting & Packing Co.

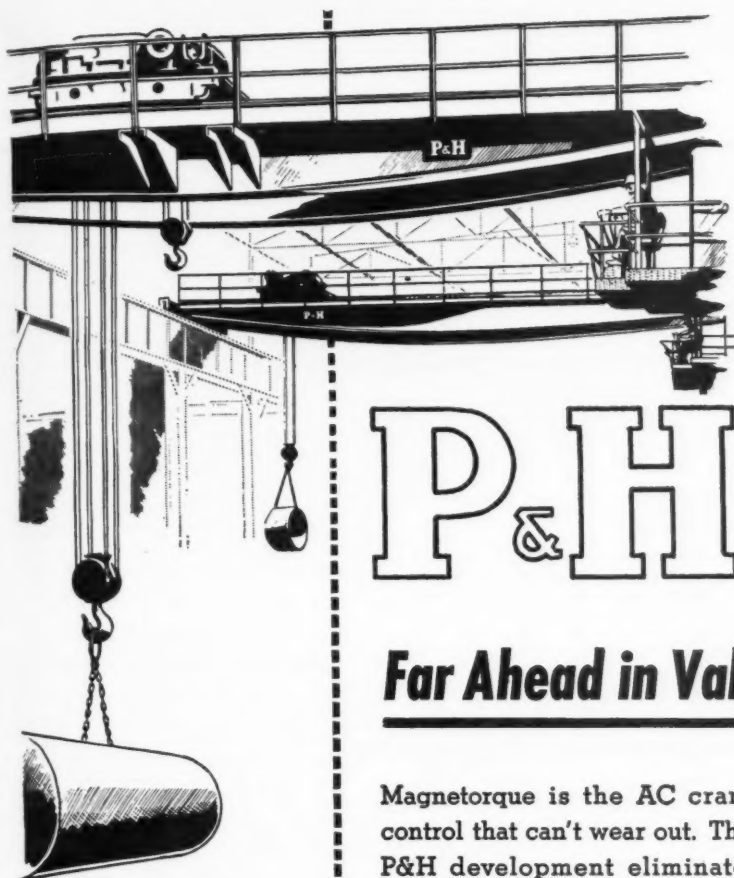


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with Magnetorque* AC Control

Far Ahead in Value and Performance

Magnetorque is the AC crane control that can't wear out. This P&H development eliminates the mechanical load brake and its need for adjustment and

relining. It operates electro-magnetically, providing unexcelled performance under *all* load conditions. And, it lasts the life of your crane.

*Trade-mark of Harnischfeger Corporation for electro-magnetic type brake.



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Los Angeles 59, Cal.

HARNISCHFEGER CORPORATION BRANCH OFFICES:

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SEATTLE 4, Washington
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DENVER, Colorado
Rm. 415, Central Bank Bldg.
1108 - 15th Street

NOW BUILT IN THE WEST FOR THE WEST!

Now, P&H Overhead Cranes are built "next door" to the job — in our new Los Angeles plant. This means better service to Western industry. Our new P&H Pacific Division, a large

and experienced sales and service organization is backed with complete stocks of genuine P&H repair parts to serve you.



the P&H Line



IN OUR MAILBOX

... Continued from page 24

article was unusually fine, and certainly a credit to the distributing industry and a credit to *Western Industry*.

WALLACE CAMPBELL, President
Campbell Hardware and
Supply Co.,
Seattle, Washington.

(The article mentioned above dealt in detail with the service performed by the industrial distributors in the West, showing how they develop markets for the manufacturer and relieve him of the financial burden and problem of doing his own warehousing and sales work.)

* * *

Our Stand Approved

Editor, *Western Industry*:

Congratulations are due you for your editorial "Protecting Industrial Development" in pointing up a very important problem which industry is facing in many communities. In San Leandro, we have been aware that zoning must protect industry as well as residential and commercial areas. Our zoning ordinance for several years now has forbidden residential development unless hearings and a special use permit is granted by the Planning Commission and City Council. To date our Council has been very firm in its insistence that industrial areas be protected.

Just recently, the Alameda County Board of Supervisors adopted an ordinance which requires the same procedure before any resi-

dential development can take place in an industrially zoned portion of the County. This is particularly important in County areas adjacent to our San Leandro city boundaries.

We recognize that residential development must have room to grow in; at the same time is entitled to full protection and we have used this point of view repeatedly as a selling point for industrial prospects. Our \$40,000,000 of diversified industrial development during the past four years is proof that this point, along with others, has been effective.

Best regards to *Western Industry*.

FRANK M. KING, Manager
San Leandro Chamber of
Commerce
San Leandro, California.

(This letter also deals with the industrial zoning situation discussed in our August editorial.)

* * *

Western Industry Helps

Editor, *Western Industry*:

I read with interest your editorial "Protecting Industrial Development," which appeared in the August issue of *Western Industry*.

The question of protecting industrial property has been a problem in the Area for some time and one which the Council has been giving a great deal of consideration.

Through the facilities of the Planning Technicians Committee, we have under way at the present time, a study of Industrial Land Use and Industrial Zoning. The purpose of this study is to furnish the Council

with current zoning information which can be used by Planning Commissions, Boards of Supervisors and other groups having the responsibility for this activity. Some progress has already been made but much remains to be done.

We have also given consideration to the formation of a non-profit group which could purchase and hold industrial property in order that "hardships" similar to the Contra Costa case do not occur. So far, there has been no apparent need for such action but I can assure you that if required we will certainly give it every consideration.

I believe that *Western Industry* is doing a great deal to assist in the industrial development of the West.

FRANK E. MARSH
Executive Vice President and
General Manager
The San Francisco Bay Area
Council, Inc.,
San Francisco.

(The Bay Area Council's work supplements that of the City of San Leandro and Alameda County, by acting as a clearing house for information as to what communities are doing, thus alerting them to possible dangers.)

* * *

Recognition for Materials Handling Issue

Editor, *Western Industry*:

We would like to congratulate you on your Materials Handling Issue of August. It is another step up in materials handling.

On page 53 you had a particularly interesting article on mechanization of canned goods. Extremely interesting to us as you show one of our trucks in action.

LYNN HALL
Sales Promotion Dept.,
The Hyster Company
Portland, Oregon

(The annual Materials Handling Number of *Western Industry* covered many developments in the West in this phase of industrial operations, of which the mechanization of the canning industry was one. Another important feature of this issue was a survey of management ideas and practices in regard to materials handling.)

* * *

Likes the M-H Issue

Editor, *Western Industry*:

It was a real pleasure to have the opportunity to look over the August Materials Handling Number of *Western Industry* and you should be complimented on having produced a magazine which is at once attractive, interesting and useful. We shall make special mention of it in one of our early bulletins.

R. C. SOLLENBERGER,
Executive Vice-President,
Conveyor Equipment Manufacturers Assn., Washington, D. C.

(The Materials Handling Number covered many new and interesting conveyor applications.)

* * *

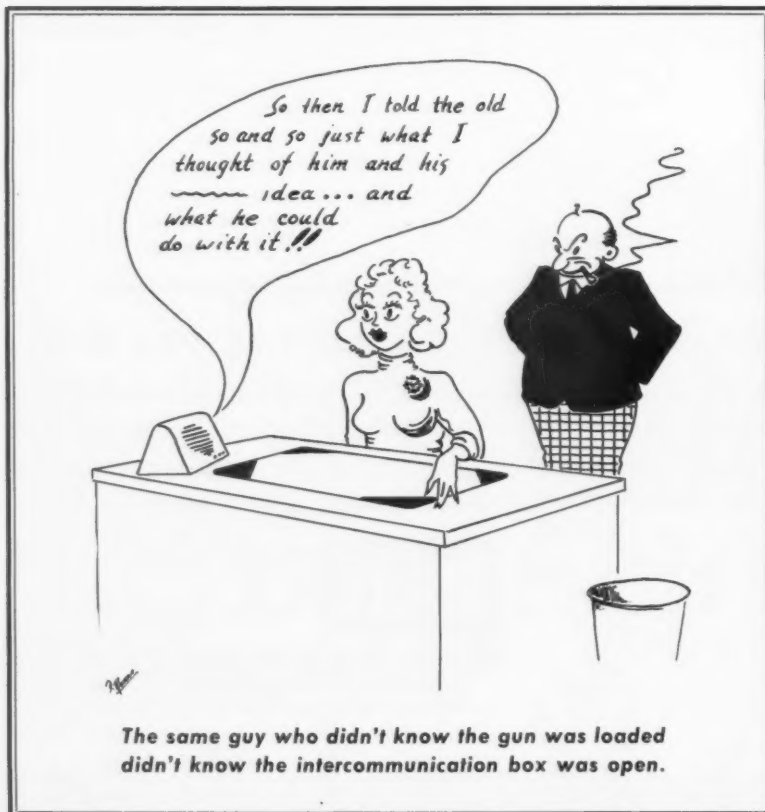
You're Welcome

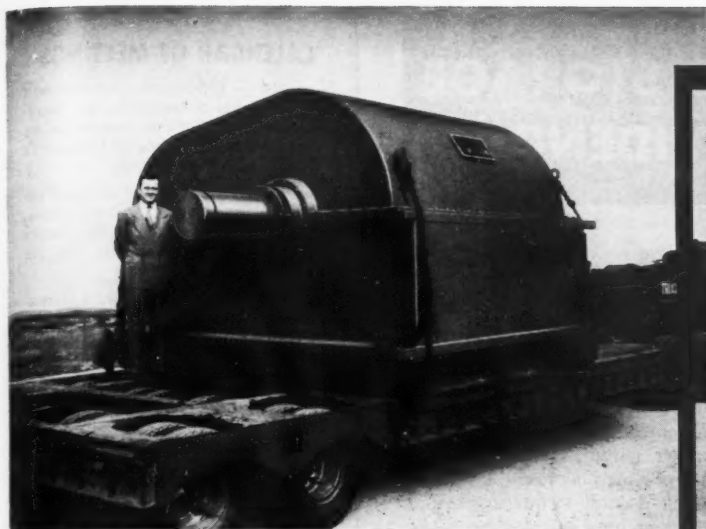
Editor, *Western Industry*:

We greatly appreciate this publication—it is informative, concise, and what's more, covers the West Coast. Thank you kindly.

H. K. HASKELL, Sales Department
Northwest Syndicate, Inc.
Tacoma, Washington.

Western Waggy by Rodg

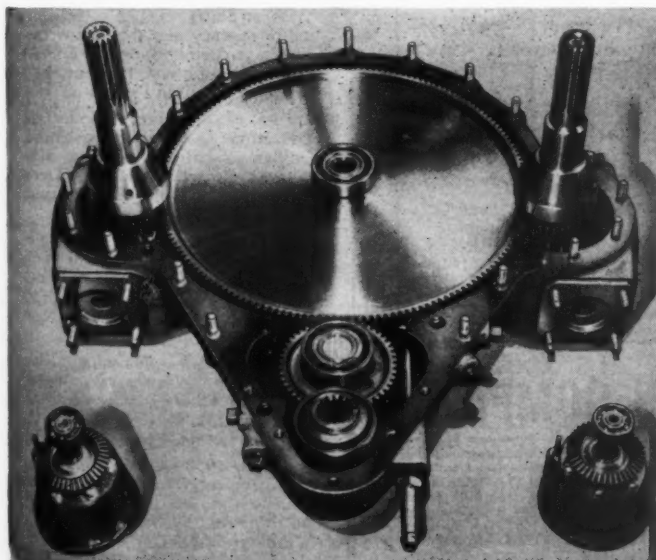




Here is an example of a large, special Pacific-Western transmission used for driving a dredge cutter head. It weighs 75,000 pounds, is rated 1000 HP at 600 rpm input speed — with overload relays for operation up to 3000 HP. It operates at angles as much as 50 degrees off horizontal, partially submerged if necessary. The case is a weldment. The input gearing is herringbone, the output gearing is helical.



In contrast to the dredge cutter drive is this precision-quality, air borne auxiliary, power-unit drive for an experimental project developed by Solar Aircraft Company. Powered by two gas turbines, the gear box drives an alternator, an exciter and six accessory pads. Input speed is 24,000 rpm, output speeds range from 3000 to 24,000 rpm. Its starting-motor clutches allow the use of either or both turbines, and enables starting either turbine from the electric starter. The gear train consists of highly loaded, hardened, alloy steel spur and bevel gears mounted on anti-friction bearings.



NEED SPECIAL GEARED DRIVES?

*Let Our
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Go to Work for You*

Save dollars and save time by consulting Pacific-Western specialists when in need of special geared transmissions, of any type, in any quantity. We offer you experience... design and production skill... and facilities that cannot be duplicated.

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— and general Manufacturing Industries

Your nearest Pacific-Western plant or office will gladly help you with detailed information, catalogs, or specific quotations, whenever you need geared transmissions of *any* type.

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5133

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HORTON ELEVATED STORAGE PAYS EXTRA DIVIDENDS

Horton elevated water tanks *pay off* in many important ways. The tank is always ready to give you 'round-the-clock service. The reason for this dependable



Above: 25,000-gal. Horton ellipsoidal-bottom elevated water storage tank —35 ft. to bottom—built for the Di Giorgio Fruit Corporation at Borego Springs, California.

performance is that Horton tanks operate under gravity pressure.

When used to provide gravity pressure in water systems supplying water for general service, they maintain uniform pressure in the water mains.

When coupled with an automatic sprinkler system, better fire protection is obtained because the water in the tank is ready to flow the instant a sprinkler head opens. This added safety often means lower fire insurance premiums.

Horton elevated water tanks also make it possible to reduce operating costs because they can be refilled during off peak periods when power rates are low.

Investigate the advantages of installing a Horton elevated tank at your plant. Ellipsoidal-bottom structures are built in standard capacities from 15,000 to 500,000 gallons. Write our nearest office for full information.

OTHER HORTON ELEVATED WATER TANK PLANT INSTALLATIONS ON THE WEST COAST

● Continental Can Company, Portland, Oregon — 75,000-gal. elevated tank for fire protection.

● Kern County Land Company, Bakersfield, California — 100,000-gal. elevated tank for cattle feed processing and fire protection.

● Ford Motor Company, Los Angeles, California — 100,000-gal. elevated tank for fire protection.

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Atlanta 3.....2144 Healey Building
Birmingham 1.....1560 North 50th Street
Boston 10.....1065-201 Devonshire Street
Chicago 4.....2132 McCormick Building
Cleveland 15.....2256 Guildhall Building
Detroit 26.....1567 Lafayette Building
Havana.....402 Abreu Building
Houston 2.....2164 National Standard Building

Los Angeles 14.....1570 General Petroleum Building
New York 6.....3334-165 Broadway Building
Philadelphia 3.....1666-1700 Walnut Street Building
Salt Lake City 4.....568 West 17th South Street
San Francisco 4.....1578-200 Bush Street
Seattle 1.....1369 Henry Building
Tulsa 3.....1667 Hunt Building
Washington 6, D. C.....1171 Cafritz Building

Plants in: BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

CALENDAR OF MEETINGS

Nov. 14 — Industrial Development Conference, Sacramento, at Sacramento State College. Sponsored by Sacramento Chamber of Commerce and other organizations.

Nov. 15-16—Association of Food Industry Sanitarians, Wilton Hotel, Long Beach, Calif. Contact James B. Robinson, pres., 1951 6th St., Berkeley, Calif.

Dec. 7-8 — Coal Research, Incorporated conference, Lewis-Clark Hotel, Centralia, Wash. Contact F. W. Mathias, sec., Olympia Chamber of Commerce.

Jan. 10-11, 1952—Canners League of California, Annual Fruit and Vegetable Sample Cutting, San Francisco. Exact location of activity to be announced in future edition of this column. Contact M. A. Clevenger, Executive Vice President, Canners League of California, 64 Pine St., San Francisco, GAfield 1-3791.

Jan. 31, Feb. 1-2, 1952—Colorado Mining Association 1952 Mining Convention at Shirley Savoy Hotel, Denver, Colorado. Contact Thelma Abel, Secretary, Colorado Mining Association, 204 State Office Bldg., Denver 2, Colorado.

March 16-18, 1952—Canners League of California, 1952 Annual Directors Meeting, at Santa Barbara Biltmore, Santa Barbara, California. Contact M. A. Clevenger, Executive Vice President, Canners League of California, 64 Pine St., San Francisco, GAfield 1-3791.

March 20-22, 1952—Electrical Maintenance Engineers Association of Southern California, Industrial Electrical Show and Technical Conference, Culver City Memorial Auditorium. Contact Richard Rogers, chairman, 1952 Electrical Show, c/o EMEA, 511 Architects' Building, 816 West Fifth Street, Los Angeles 17, California.

April 4-5, 1952—Annual meeting of Western Highway Institute, 11 Western States research and coordination agency for the motor carriers, at Palm Springs. Contact Western Highway Institute, 417 Market Street, San Francisco.

April 4-5, 1952—California Industrial Education Association convention, Oakland, California. Contact Mrs. Eleanor Hewlett, Laney Trade School, 240 E. 10th St., Oakland, California.

May 12-15, 1952—American Petroleum Institute Division of Refining convention at San Francisco. Contact Lacey Walker, Secretary, 50 West 50th St., New York 20, New York.

May 18-21, 1952 — National Office Management Association convention at San Francisco. Contact C. A. Spangler, 132 West Chelton Ave., Philadelphia 44, Pennsylvania.

May 20-23, 1952—Office Equipment Manufacturers Institute, at San Francisco. Contact E. D. Taylor, Ad. V. Pres., 1903 N. St., N. W., Washington, D. C.

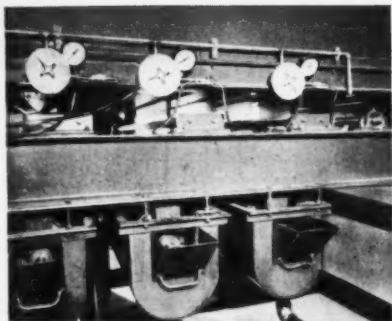
ROSS-WALDRON

Tower Treater

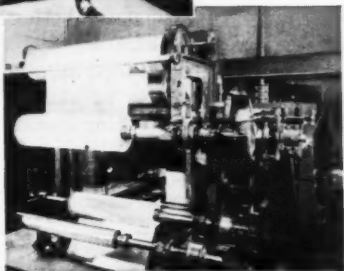
Exterior view of 30 ft. tower
showing open end of water
cooled sky rolls



APPLYING
SOLVENT TYPE
COATINGS
TO FABRICS
AND PAPER



Three of the 4 dip pans
and controls for tube
doctors



The unwind and winding
apparatus for nylon and
glass fabrics

remarkable dip coating installation for NARMCO INC., at Costa Mesa, California

As outstanding as the famous Narmco products, from glass fishing rods to resin impregnated aircraft fabric, is the unusual treating equipment which completes their processing operations. This ROSS-WALDRON 54" Tower Treater is arranged for handling 2 webs simultaneously with two solution dips each or to provide 4 dips for a single web with passage through the multipass tower dryer after each dip. The resultant greater resin build-up and reduced amount of handling accounts in large part for the superior quality of these Narmco products.



J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

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ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

November, 1951 — WESTERN INDUSTRY

Can YOU Tell Which is Which?

Both are welded mechanical tubes. One is the unique new hot rolled tube now in Ryerson stock. The other is our regular cold rolled welded tube. They are identified in the copy below.



New Stock of Hot Rolled Welded Mechanical Tubing

We are happy to offer a new Ryerson product—*hot rolled* welded mechanical tubing with a finish which is far superior to that of the usual hot rolled product. In the unretouched photograph above, this new tube is on the right.

The tube on the left is from our regular stock of *cold rolled* welded mechanical tubing. Both hot and cold rolled are in good supply at Ryerson. So you can get immediate shipment of either one in a wide range of round and square sizes.

Of course the cold rolled tube must be used for most plating and all applications which require an *extra* bright, smooth finish. But, in some other applications, our hot rolled welded tubing can be substituted—at considerable saving. Its finish is that good.

For example, the hot rolled needs no surface

preparation to take paint better than the cold rolled.

The convenience of fast, accurate cutting service is always available at your nearby Ryerson plant. And Ryerson tubing specialists will gladly work with you on any tubing problem. So call us for welded tubing, now in good supply, as well as for other tubing requirements.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated.

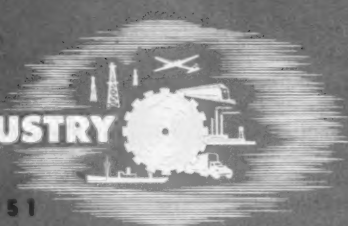
STAINLESS—Allegheeny bars, plates, sheets, tubes, etc.

MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC.

LOS ANGELES PLANT: Box 3817, Los Angeles 54. Plant: 4310 E. Bandini Blvd. Phone: ANgelus 2-6141. From San Diego (No toll) Phone: ZEnith 6660.
SAN FRANCISCO PLANT: Box 188, Emeryville. Plant: 65th & Hollis Sts. Phones: OLYmpic 3-2933, ENterprise 10176.



ONE ACCURATE SHOP ESTIMATE

is worth 1,000 guesses

MACHINE-SHOP estimating is a rather limited and specialized field and does not indicate the demands made upon the estimator by management when he is exercising his function.

Estimating in its pure form is the art of determining in advance the time to perform a given task or arriving at the cost of a desired project—in dollars and cents—by a logical method of analysis. It is the paper-work stage. It is that stage in which the imagination plays the leading role.

Once this phase of the estimator's activities is completed, he steps out of this dream work and follows his estimate through the shop in its material manifestations. He then becomes a consultant to the shop, evaluates its methods of operation and more than likely checks his estimates by time study.

Here's the Real "Pay Dirt"

Estimating as a profession has not received much recognition until quite recently. Taylor, the Gilbreths and Barnes have sold industry on time study as a paying institution. But industry is now beginning to realize that the real "pay dirt" comes from its estimating staff.

Industry is interested in the relative merits of various alternatives in operation. These alternatives are expressed in terms of production costs, the man-hours necessary, the investment in new machinery and equip-

Between your best guess and an accurate estimate may lie the difference that can keep you in or knock you out of business . . . Leave the estimating to the man who knows the job.

ment, efficiencies, and so on.

Knowledge of the efficiency of labor, the evaluation of various methods of manufacture, and an analysis of machinery capacity are fundamental to a stable economy in any industry. The ability to forecast future costs with a

mate a job means a financial loss to the shop. Too many losses mean shop failure.

Larger industries employ persons trained in the knowledge of shop methods, machine efficiencies, and the principles of motion and time study to do this work. These persons are called "estimators" and are qualified to make time and motion studies, rate the operator, evaluate methods of operation, outline from blue-prints all the necessary steps in the manufacture of a product, recommend proper tooling and production aids, and place a reasonable time value, or cost, on the job.

Needed: A Time Machine

The estimator's function is to convert time data into operation standards. Where standard data do not exist, he must be qualified to gather this information from time-study observations or draw heavily upon his own shop experience. His function is limited as an estimator without this experience.

An estimate is the length of time

By
**W. A.
NORDHOFF**
Chief Machine Shop
Estimator
Douglas Aircraft Co.,
Santa Monica, Calif.



fair degree of accuracy is the keystone of intelligent planning.

The proprietor of the small job shop is responsible for decisions affecting the cost of a product. He must think in terms of time and operator efficiency if he is to bid effectively on work. To overestimate a job means that shop loses it to a competitor. To underesti-

calculated by an estimator to be necessary for a normal operator to perform a given task. The estimator bases his opinion upon established or standard data and upon his experiences with or observations of similar or identical operations.

The difference between standard data and experience is that standard data is information arrived at scientifically by time-study observation, the statistical analysis of identical elements of operation, and logical organization of this information for ready reference, while experience is those data which are recorded only in the mind of the estimator.

Estimates are individual opinions. How closely these opinions reflect true shop operating conditions indicates the quality of the estimator. Estimators with different shop experiences will make different estimates on the same job. The estimator who can make the most reliable estimates for a shop is usually the one who has had the most experience in that shop.

An estimate is the recognition of all the elements of operation which are necessary to perform that operation, with a time value fixed for each element. An operation is the sum of its elements. Therefore, the time to perform an operation is the sum of its element times. It is the business of the estimator to know what elements make up any given operation and the time value of each element.

Mind's Eye Is Best

Does estimating for production have any advantages over time-study? I am sure it has several. One advantage is an estimator can set a reasonable standard on a job in a fraction of the time required by a time-study observer to study it.

MOTCH & MERRYWEATHER aluminum billet saw equipped with 36-in. carbide cut-off blade cuts production time to 29 seconds per piece on job.

A time study depends upon the physical presence of the work operation. The blueprint, the stock, the machine, tooling, and the operator are present when a time study is taken.

This is not the case when an estimate is made. Only a blueprint or sketch of the part is available to the estimator. He must see in his mind's eye all the processes involved in the fabrication of the part, he must postulate suitable tooling, he must know the best equipment available in the shop for the various operations, and he must anticipate every move of each person who will be engaged in the manufacture of the part in order to arrive at a dependable time estimate on the part.

"Bum Steers" from Operators

Standard setting for production under these conditions is not possible by time study. This is true also of small job-lot sizes. The estimator can set standards on these small lots before they get into the shop, but it would not be possible to get a representative time study of the job in the shop because of the limited number of parts involved.

One of the nightmares of my existence is to know when and how much an operator is "kidding" me when taking a time-study observation on a job. Many times have I felt that my production estimate was more correct than on-the-spot observation. The only rule I have to evaluate the elements of my time-study observation is my standard data.

When I resort to this to "rate" the time study, I am merely re-estimating the job and the new answer will closely approximate the original estimate. When you rate an operator anywhere under normal the time study takes on the aspect of an opinion and is subject to the same criticism as is an estimate. Although it may be the "opinion" of a man trained in time study it is still rather difficult to convince the shop that an operator who has been running a particular machine for ten years was operating below the accepted normal when the time-study observation was made.

The "How" of Production Estimating

Just how are production estimates made? To start with, remember the estimator knows approximately every element of operation that goes into the production of a part. He also has his standard data which give him the time values of these elements. He knows the various methods which will be employed to fabricate a part.

The machines in a machine shop lead, in the main, rather prosaic and

monotonous lives. The elements of their operations are limited and usually can be counted on the fingers of two hands. The more generalized and adaptable the machine, the greater the number of elements necessary completely to describe its varied operation functions. The more highly specialized a machine, the fewer the elements required to describe its functions. Some elements are common to most machines; other elements are usable only with machines of a special class.

For example, the following elements of operation will describe the operation of a milling machine, and they will repeat themselves without variation on the bulk of the work done on it:

1. Pick up part and install in some building device for work.
2. Start machine and advance work to cutter or cutters.
3. Mill dimension or dimensions.
4. Back work from cutter and stop machine.
5. Release part from holding device.
6. Aside with part to tote pan.

If one knows the time values for the elements described and refers to cutting tables for the time to mill, he can estimate rather accurately the time required to perform the operation.

The Human Element

This, however, does not complete the estimate. The personal needs of the operator must be taken into consideration, the factor of fatigue must be allowed, and an allowance must be made for tool sharpening and adjustment from time to time. The personal allowance is an arbitrary factor and 5 per cent is the generally accepted figure.

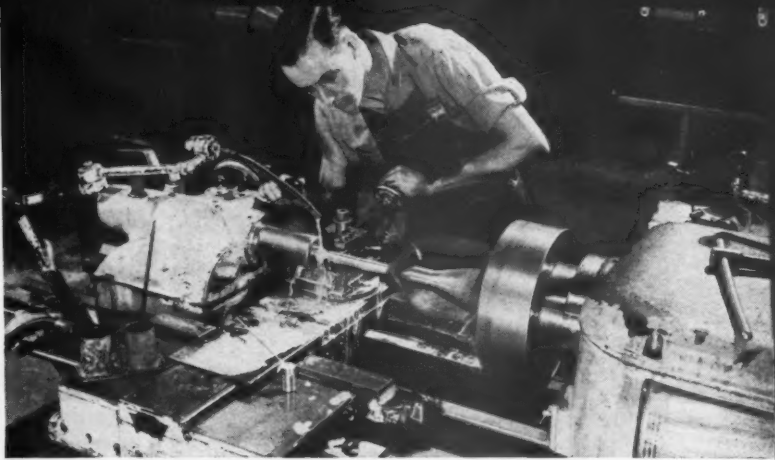
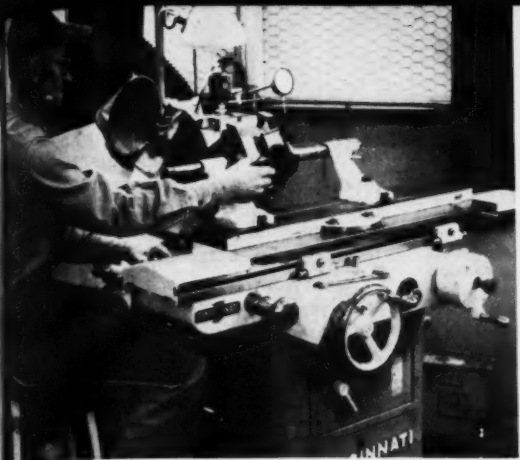
Fatigue is a variable factor and an allowance is made based upon the judgment of the estimator as to the amount of fatigue developed in running the job. Tool allowance is based upon the life of the tool operating continuously in metal in performing its work.

The estimator places a unit time value for these allowances and adds this to the unit time to make a part. Multiply this by the number of parts you wish to produce and you have the total run time for the job exclusive of the make ready or setup time.

The setup time is arrived at in a similar manner to arriving at the run time. Setups can also be broken down into well defined elements although we use the term element in a much broader and looser sense than when applied to an operation.

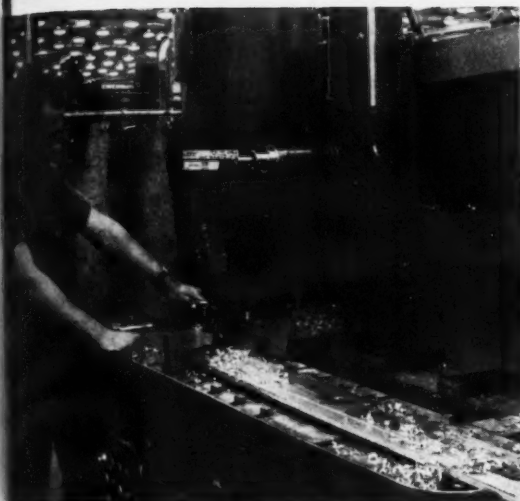
For example, the changing of a collet in the turret lathe spindle is con-





COST OF TOOLING UP to do the job is figured into the estimate, and such precision work takes much time. At upper left, grinding special design spar milling cutter for use in spar milling for C-124A Globemaster II.

PRODUCTION RUNS on aircraft parts (upper right and left) are also made with precision tolerances. Set-up time on this work is as important as production.



partment. We were handed the blueprint of a large nut some four inches in diameter to estimate the cost of manufacture. The order called for 8,000 of these nuts to be made. We wrote an outline of the manufacturing processes involved and estimated the part should cost the company 75 cents apiece.

This information was given to a buyer for the company who was to be responsible for purchasing this part outside of the plant. The next day he came to us very upset and said that if this part could be produced in the time we said it could, he would eat the part. "Without pepper and salt," he added.

The best bid he had been able to receive up to this time was \$2.25 per part. He was so sure our estimate was wrong that the part was given to another estimator for his opinion. A re-evaluation of the estimate left the picture the same. The second estimator said the original estimate was all right or, if anything, a little on the high side.

Success . . . and a Sequel

The buyer was told to try again and to see how near 75 cents he could get the job done. He finally was able to subcontract the part to an outside shop for a price that was close to the estimate. The company saved \$10,000 on this one order by making use of its estimating department.

There is a sequel to this story. We asked the buyer later if it were possible to visit this vendor's plant and to find out how he was making out on his bid. To make a long story short, the buyer found out that the vendor was not even doing the job, that he had, in turn, subcontracted it to another machine shop, and both parties were making a comfortable margin of profit out of it.

(To be concluded in the December issue)

sidered one element although it involves the removing of the spindle guard, removing the collet hood, removing the collet, storing the collet in its proper place, selecting another collet for the job, inserting the collet in the spindle, securing it in place with the collet hood and reinstalling the spindle guard. This can be done in approximately 1.5 minutes.

Installation of the stock stop, box mill turning tools, threading dies, cut-off tools, and so on each carry a time value. Time for the setting of longitudinal feed stops, added time values for close tolerance work, time for boring chucks with soft jaws, and so on, all go into the estimate of the setup.

No necessary function of the operator is omitted when making the estimate of his job.

Savings on Subcontracts

The production estimate not only gives the company a measuring stick to determine the effectiveness of its production departments, it also gives the company a basis for evaluating bids on subcontract work. A company which subcontracts a large part of its work can save many thousands of dollars annually by utilizing the services

of its estimating staff.

Douglas Aircraft Company is such a concern. Many manufacturing plants in the Los Angeles area are or have been engaged in doing sub-contract work for it.

Douglas maintains a very effective estimating department. It is doubtful in my mind if any manufacturer in the West maintains as efficient, well equipped and as alert a group as this one. Very few decisions are made concerning the purchasing of new capital equipment, the laying out of new fabricating and assembling areas, the erecting of new buildings without first consulting its estimating staff.

For example: The supervisor of the machine shop makes a request for new capital equipment. This request is immediately turned over to the machine shop estimator for his analysis of the need for such new equipment. If, after carefully weighing the facts, the estimator finds the new machine will make a better part, produce it more economically, and production requirements warrant it, he will approve its purchase. If he cannot justify it, he recommends that the equipment not be purchased at this time.

Let's get back to the purchasing de-

PLYWOOD

... when and how to paint it

Finishing techniques and materials are generally similar to treatment of Douglas fir or softwood, but there are some important exceptions

THE QUESTION of suitable paint finishes for specification applications of plywood is naturally raised by the wide divergence of uses for plywood. This all-purpose wood panel material has been finding new uses in end products and in production line installations. Plywood can be found in pickling tanks, soaking vats, chutes, bins, freezers, railroad cars and steam boxes. End-use products utilizing plywood grow more numerous every day.

Obviously, the finish on a newspaper carrier-boy's wagon will not be the same as the paint used in an acid tank, but generally the problem is easily resolved. Continuous research and testing in the laboratory and in the field indicates that a satisfactory finish for wood in any application will usually be satisfactory over Douglas fir plywood.

Acceptance of this fact requires an understanding of the material. Douglas fir is one of the most available of softwoods and grows in immense stands and tremendous log size west of the coast range in Washington, Oregon and California. It is one of the strongest structural woods known and is second only to redwood, cedar and cypress in durability.

Properties of Plywood

When made into plywood, the panel product retains the advantages of wood and eliminates or minimizes its limitations. Rotary cutting of the log in the plywood lathe produces a continuous sheet or veneer.

When clipped to size, the veneer

sheets are assembled with the grain of each layer running at right angles to adjacent plys. The manufacturing process thus produces a real wood panel material—but it is wood with a new dimension, new structural properties and a new appearance.

Rotary-cut fir plywood has an attractive, distinctive grain pattern consisting of bands of alternating spring and summer wood. Cross-bonding does two things. It creates broad dimensions—standard size panels of wood 4 x 8 ft., and others in larger dimensions. And it gives the panel two-way strength where wood is strong only along the grain. Despite these changes, plywood retains the paintability of Douglas fir.

Finishing techniques and materials, therefore, are the same as those for Douglas fir or softwood in any given application, with some exceptions. These are created by the mechanics of the reaction of wood and plywood to changes in moisture content. The reaction differs, as plywood retains a high degree of dimensional stability in the process. Simultaneously, the panel surface may be subject to minute movement not found in ordinary lumber.

This means that where plywood is subjected to frequent changes in moisture content, it may be susceptible to surface checking. That tendency, however, can be almost entirely offset by

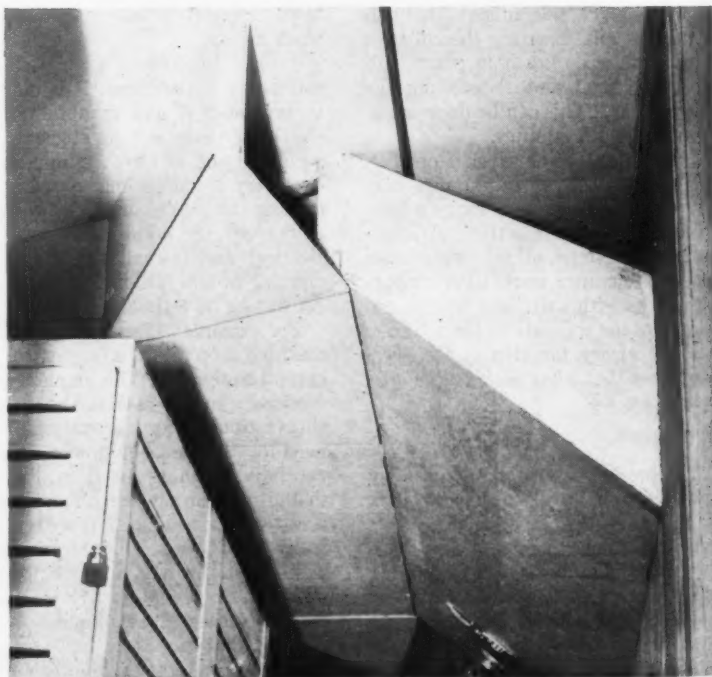


By

THOMAS H. MORAN

Research Chemist
Douglas Fir Plywood
Association

DUCT IN FREEZER PLANT, made from plywood, can be finished with elastic film paint such as used conventionally on exteriors.



using finishing materials and techniques that conform to the properties of plywood.

Although uses for fir plywood number literally in thousands, the conditions under which it serves are easily classified. These would include installations where the material will be exposed to:

1. Acids, acid vapors, other active gases.
2. Sharp changes in moisture content, steam, fluids, high heat, sub-zero temperatures, weather.
3. Continued wear and abrasion.
4. Normal interior use.

Acids and Acid Vapors

Plywood encounters acids and acid vapors in the metal products industry where it is used for electrolytic cells, pickling tanks, filters, ducts, vents and other installations. In one plant making powdered metal, it is used for electrolytic tanks carrying sulphuric acid in high concentrations and for filters to clean the electrolytic fluid used in the process. Fir plywood and for years Douglas fir lumber have been used in pickling tanks for metal containing solutions of 2 to 15 per cent hydrochloric or sulphuric acid under temperatures of 160 to 212 degrees Fahrenheit.

Several acid, gas and fume resistant paints for wood and plywood are available from national paint manufacturers and when used for tanks or other applications where the plywood comes in constant contact with heavy acid concentrations, a protective finish is desirable. For his acid tanks, one manufacturer uses six coats of a vinyl-resin paint. Leak-proof joints are obtained by setting plywood edges in a synthetic rubber mastic compound.

Often, where appearance is unimportant, plywood may be used in the presence of acid gases and fumes for ducts, vents, partitions or other installations without any finish.

Special or unusual conditions are apt to occur in chemical plants, pulp mills, breweries and similar operations. Wherever possible, the prospective user of plywood should check with representatives of the paint manufacturers. Many specially formulated finishes resistant to various types of chemical fumes and vapors are available. Other finishes can be specially prepared to meet a given set of conditions.

Extreme Moisture Conditions

Because of its wide dimension and structural qualities, plywood is often used in applications where it is exposed to steam, high humidity, concentrated moisture and sub-freezing

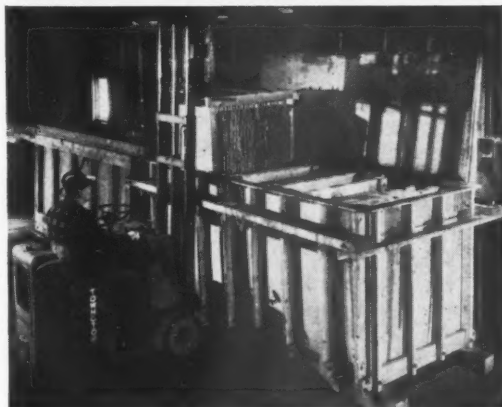
SOAKING TANK can be finished with so-called wet-wall finish. This special enamel, recommended for application over wet surfaces which seldom are dry, makes a coating that's easy to maintain.



PLYWOOD FILTERS used in cleaning electrolytic acid bath are painted with patented acid-resistant paint to prolong life of the wood. Exceptionally punishing applications like this may require special finishes. View at right is at plant of Tacoma Powdered Metals Co.



TANKS OF PLYWOOD that hold non-active or non-corroding solutions, such as water, may not need painting unless appearance is an important factor. Impregnation tank at right is used for treating wood battens at West Coast Chair Co., Tacoma.



temperatures. Bakeries use it for humidity ovens. In tobacco ordering boxes, plywood is subjected to frequent, recurring high steam pressures. Water and other fluids remain for days in plywood soaking vats and tanks. Boiling water is poured over it in testing laboratories. In freezers and refrigerators plywood is subjected to continued severe temperatures and changing moisture conditions. It is exposed to temperatures of 40 degrees below zero in coverings for conveyor belts in quick frozen fruit juice production.

None of these conditions is a hazard to Exterior plywood which is produced

with a completely waterproof bond stronger than the wood itself. Boiling, weathering, soaking or drying will not faze this bond.

But like all woods, plywood requires adequate paint protection under such conditions to maintain maximum appearance properties and prolong the life of the wood. The paint cover serves to slow down the rate of moisture penetration into the wood and to reduce to a minimum the minute movements in the surface of the wood caused by changing moisture conditions. No matter what finish or paint system is used, however, wood will tend to assume over a period of time

the same moisture content as the surrounding atmosphere.

Plywood is often used in plants and laboratories for vats and soaking tanks containing water and for installations which are exposed to sustained conditions of damp. Plywood is a good base for the so-called wet-wall finishes which may be used under such conditions.

Most coverings of this type are enamels formulated for application over damp or wet surfaces. They are often used in coolers, refrigerators, and other equipment in excessively damp locations where extra protection is desired and where appearance is a factor.

When appearance is not important, use of plywood without any finish is quite satisfactory.

Another suitable cover for installations holding water is a high-grade marine-type enamel finish.

Extremes of Moisture and Weather

In industrial applications where plywood is exposed to weather or to interior plant conditions similar to the effects of weather (frequent changes of humidity, temperature changes, etc.) and where an attractive long-lasting finish is desired, the high grade white lead and oil paints may be satisfactory.

They tend to chalk, however, over a period of time and should not be used where subject to abrasion, as in lockers or bins. The high grade TLZ (titanium, lead, zinc) exterior paints are also recommended. The TLZ paints tend to offer more lasting appearance properties but both give equal protection to the wood.

Wherever such a finish will be exposed to acid fumes or vapors a lead-

PLYWOOD PAINTING POINTERS

WHERE APPEARANCE is not important, as in the air duct of a pre-freezer unit in a quick freezing plant for fruits and vegetables, no finish is required, but some protection is afforded by a coat of lead and oil primer.

If panel material is exposed to changing air conditions, as in a bakery proofing cabinet where the 95 degree temperature is maintained in the interior, with humidity of 85, a good finish is exterior white lead and oil paint which offers maximum protection.

Another example of punishing conditions is an ice cream condenser, where moisture and low temperature are encountered. Here a good finish would be flexible film paint such as white lead and oil. The user should check the finish to be used where there is contact with edible products.

In the case of a heavy-duty tank holding an acid bath in an electrolytic manufacturing process, the plywood was painted with six coats of resin-vinyl paint, and the joints were set in a rubberized compound. The finish protects the wood, but the dents, scratches or breaks in paint resulting from daily use do not endanger the plywood construction, despite high acid content of the solution.

For tobacco ordering boxes, where moisture is added to the tobacco by injecting steam into the box, the exterior of the boxes could be painted with high grade aluminum paint or exterior white lead and oil paint. The interior is unfinished.

free paint is recommended. The lead component under such exposures tends to discolor the finish.

Prior to installation, plywood that will be subjected to severe moisture or

weather conditions should be edge-sealed to prevent excessive moisture entering the end-grain. A heavy coat of top-quality ready-mixed exterior primer or exterior type aluminum paint offers good protection.

Paste type calking compounds tend to dry out and lose adhesion during aging and perhaps are not as desirable for edge-sealing as the paint application.

Primers

The prime or first coat is important. Best results are obtained with normal drying high-grade prepared exterior primers reduced with pure linseed oil or according to the manufacturer's directions.

One good primer can be mixed from three parts soft paste white lead, four parts raw linseed oil, two parts turpentine and ¼ pint drier per gallon of paint. If boiled oil is used, the drier is not necessary. Another good primer may be compounded from aluminum paste and top quality long oil spar varnish.

Fast drying primers, even though formulated from high grade materials, are not recommended where maximum protection against face checking is desired. Apparently, the components used to provide fast drying properties in such primers may affect adversely the weatherability of the paint coat.

As an extra precaution under severe conditions of exposure, plywood can be treated with a toxic water repellent. This should be applied to the bare wood prior to the prime coat and allowed to dry several days before the paint is applied.

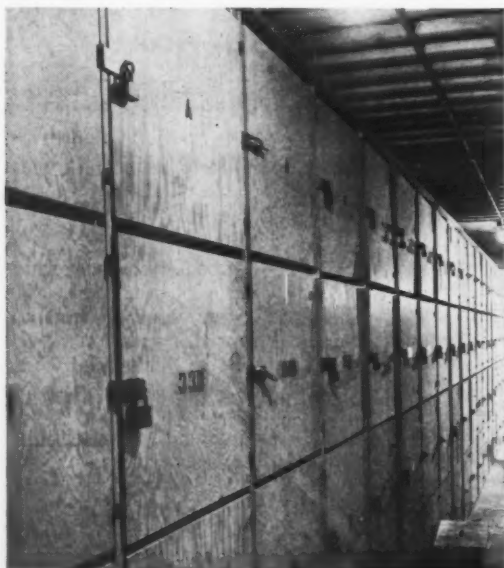
Experience indicates that maximum protection is obtained from a three-coat paint system—one coat primer and two finish coats. A two-coat system may be used where weathering conditions are mild, but for weatherability comparable to a three-coat cover an equal dry film thickness is necessary.

Interior Finishes

For normal interior applications, conventional interior paints and enamels are quite satisfactory over plywood. Best results are obtained from careful priming and high grade materials.

When using water-thinner paints, the plywood should be sealed first with a clear resin sealer, shellac or flat white paint to prevent grain raise. Further coats are applied according to the manufacturer's directions.

Where a particularly smooth, joint free surface is desired, the plywood surface may be covered with painter's canvas or unbleached muslin. Plywood joints should be butted closely and all



APPEARANCE may dictate final finish for plywood lockers, bins, carts, etc. For lockers at left, no finish was used. For ordinary interior use, plywood is a good base for conventional interior finishes. Varnish adds abrasive resistance, hard finish surface.

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**By building this factory
as a group of units, a
Portland photographic
firm emphasizes that...**

DISPERSAL divides hazards and concentrates comfort

IN SOME INDUSTRIES the ob-
jective in the layout of a new
plant is not to get everything
under one roof with a minimum of
movement from one station or depart-

ment to the next, but rather to spread
concentrated operations out into sev-
eral buildings with ample space be-
tween.

There are two objectives involved:

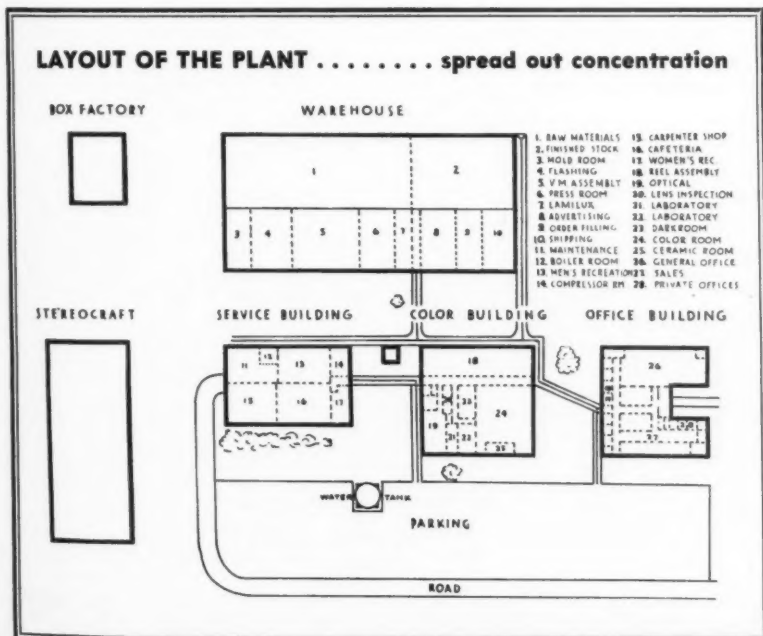
(1) making operating conditions more
pleasant for the working force; (2)
reducing fire hazard and insurance
rates.

Sawyer's, Inc., of Portland, manu-
facturers of photographic specialties,
are an example of this type of layout,
in their new \$1,000,000 plant com-
pleted earlier this year. An area of
121,000 sq. ft. is covered by six build-
ings, which are spaced 80 ft. apart.

This not only amply meets all fire
and insurance requirements, but also
provides a margin for expansion be-
tween structures without appreciable
increase in fire risk or insurance costs.
Further, it provides better light and
working conditions, in which comfort
of employees is ranked equally with
efficiency.

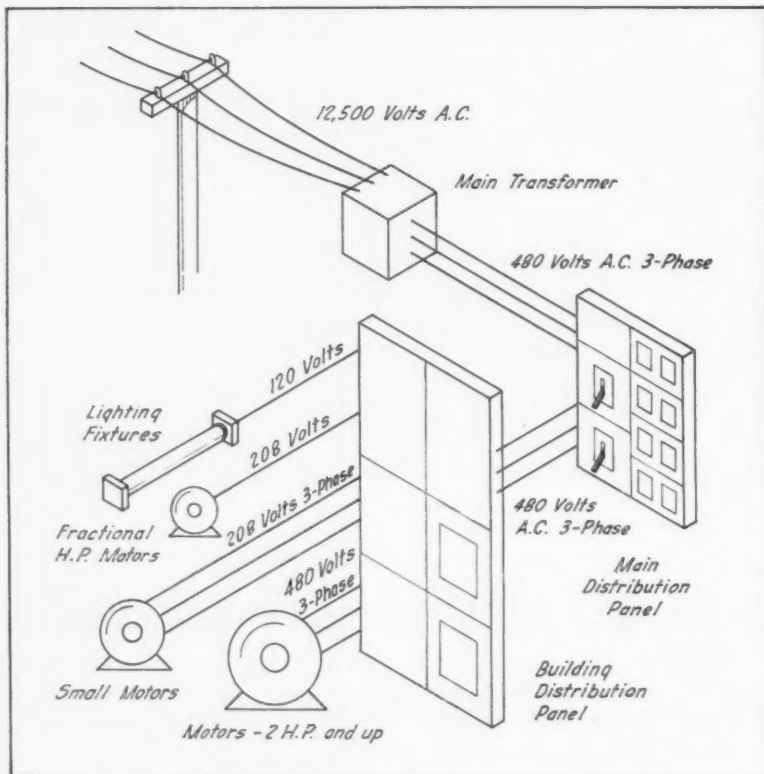
"Progress"

Operations of Sawyer's, Inc., had
been carried on under the shadow of
Portland's stadium, close to the main
business district, in quarters that
underwent several expansions until an
entirely new plant becomes necessary.
Accordingly, a 15-acre tract was
chosen outside the city limits at a
cross-roads settlement bearing the ap-
propriate name of "Progress," in an
attractive country setting, yet only a

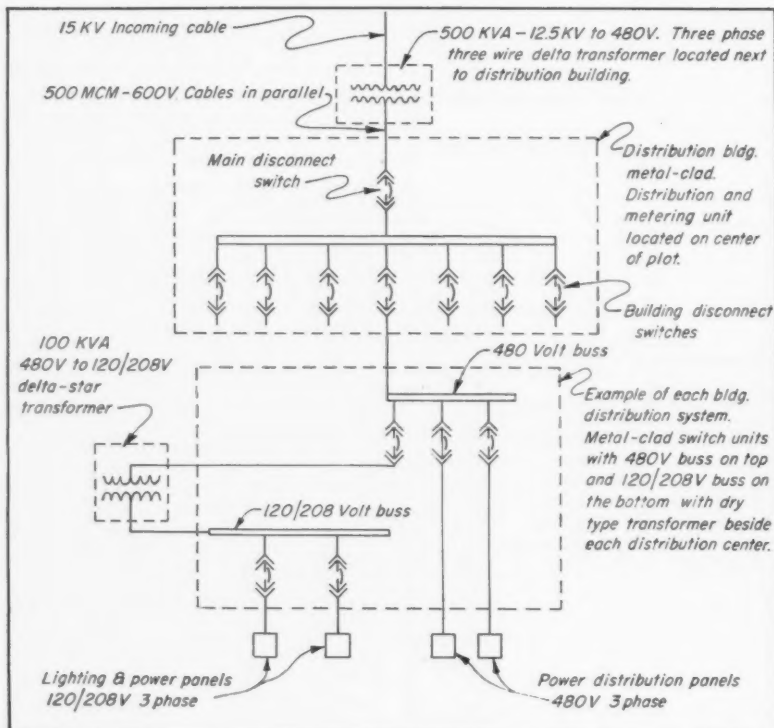


THE ELECTRICAL SYSTEM AT SAWYER'S . . .

... this shows how the electrical power is distributed



... and here's how it looks to an electrical engineer



few minutes drive from downtown Portland.

Existence of a seasonal peak before the holiday season demands the accumulation of large inventories of finished goods and raw materials, both of inflammable nature. This situation increases the necessity of adequate fire protection, which is provided by fire walls within the structures and separation of the buildings themselves, thus making it possible to confine damage to small areas. The arrangement also frees other buildings from noise and vibration emanating from press operations.

Covered Building Connections

Quick and easy connection between buildings is provided by covered walks, which also serve as runways for lift trucks to move loads from one point to another. These walks range from 8 to 10 ft. in height, except for the one connecting the office and cafeteria, which is seven ft. high. Width between posts is nine feet, and widened out beyond this when change of direction in lift truck movements is required. Walks are roofed with corrugated aluminum sheets, and steam pipes are carried under the peaks of the roofs.

Operations begin and end in the warehouse, which also houses the plastic molding department for outer cases of the View-Master, the View-Master assembly room, order filling and advertising departments.

The building has four car doors along the west wall facing the railroad siding, and covered truck bays on the south and north ends, the former for incoming supplies, the latter for out-

LITTLE ACORN

A PHOTOGRAPH developing shop is the tiny acorn from which grew this corporation that now sells its products all over the world. Its best known items are used conjointly, namely stereoscopic transparencies, mounted on a disk and viewed with a special plastic stereoscope called the "View-Master."

The pictures bear much the same relation to the instrument, as far as volume is concerned, as blades to safety razors or ordinary photographic film to cameras.

Supplying the photo finishing needs of the Portland Owl Drug Store in 1914 under the name of Sawyer Photo Service was the genesis of Sawyer's, Inc. In 1919 the founder, Carlton Sawyer, was bought out by three brothers, Edwin, Fred and Al Mayer, with Ray Kelly. The four expanded the service over the Northwest until they served more than 350 drug stores.

going finished goods. On the incoming side there is a covered platform also usable for delivering direct from the motor trucks by lift truck to the different departments.

Dimensions of the warehouse are 80 x 334 ft. overall, and a cross-wall separates raw material from finished goods. A second firewall lengthwise of the building separates warehousing operations from the other departments previously mentioned. Spacing between columns is 29 x 20 ft., and there are 14 ft. of clear space from floor to roof beams. Floor scales are to be found at each end of the warehouse.

In the section where the plastic frames are stamped the building is two stories high, to permit sacks of molding powder to be carried up by freight elevator to bins, from which the powder is fed by gravity to the presses.

Stereocraft has no covered walk connections with other buildings, but is served direct by motor truck. Projection machines and cameras are manufactured here, and the building also contains a machine shop, stamping machines and other equipment, plus a paint room where the instruments are lacquered.

The color building, 127 x 120 ft., houses film developing operations, mounting the film on cardboard discs, lens grinding and a ceramics room where small figures for photographing are modeled. Through the center is a passageway which provides a short cut from the office building to the cafeteria.

Included in the service building are the cafeteria, women's and men's recreation rooms where those who bring their own lunches may eat, and

UNISTRUT FIXTURES enable one electrical drop and simplified supports to hang nine fluorescent fixtures to light exacting work. Lights can be moved at will along Unistrut rails.



IN THE MOLDING ROOM. Bakelite-type molding powder pours down from second-floor hoppers into these 50-ton automatic Stokes molding machines, which operate day and night, seven days a week.



..... BIG OAK

In 1924 they moved from their attic loft to a two-story building in the shadow of the Multnomah Civic Stadium, eventually expanding to three other buildings. Soon after Harold Graves, now president of the company, joined the firm in 1926, they began production of photographic postcards and scenic packet sets.

Addition of photographic greeting cards made a national organization of Sawyer's, Inc., and paved the way for utilizing William B. Gruber's idea for the View-Master, which made its first public appearance at the New York and San Francisco world's fairs. During the war the View-Master was used to train aerial gunners and Navy personnel in naval ship recognition. The apparatus has been considerably improved upon since then, and future products of this vigorous Portland company include stereoscopic projectors and cameras.

MANY ASSEMBLY LINES turn out thousands of View-Master stereoscopes, projectors and light attachments per day. From raw molding powder to finished and packaged article consumes less than four minutes.



ENGINEERS

Consulting Engineers:

Layout and construction: *Robert E. Kremers.*

Heating and ventilating: *W. Bruce Morrison.*

Electrical: *Wally Matson.*

CONTRACTORS, SUPPLIERS

(All from Portland, unless otherwise specified)

Building: *L. H. Hoffman.*

Electrical: *W. R. Grasle and Cascade Equipment Co.*

Plumbing and heating: *Plumbing and Heating Engineering Co.*

Inter-communication: *Campbell-Norquist Co.*

Hardwood paneling: *Hans Skibinski.*

Water tower: *Chicago Bridge & Iron Co., Chicago, Ill.*

Processing tanks: *Stainless, Inc., Van Nuys, Calif.*

Processing machinery: *Ambee Corp., Reseda, Calif.*

Temperature controls: *Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.*

Boilers: *West Coast; American Tank and Pipe Co.*

Oil burners: *Iron Fireman Manufacturing Co.*

Heating and ventilating units: *Pace; Pacific Air Conditioning Equipment Co.*

Heating and ventilating controls: *Johnson Service Co., Milwaukee, Wis.*

rooms are lined with salt glazed tile, easy to clean and not requiring painting.

BUILDING FEATURES . . .

ROOF

All buildings flat, except for sawtooth on Stereocraft.

FLOORS

Plant buildings, cement. Office, plastic tile.

WALLS

Prefabricated and erected by tilt-up method. Class C concrete, with steel reinforcement.

SASH

Factory sash, windows hinged at top to swing outward.

LIGHTING

Unistrut fluorescent fixtures. Outside floodlighting to facilitate night trucking operations.

ELECTRICAL SYSTEM

Described in accompanying charts. G-E load centers, Square-D relays.

COMMUNICATION SYSTEM

Dial-a-Talk.

HEATING AND VENTILATING

Low pressure central steam plant, fired with rotary oil burners using both Pacific Specification #300 and #400 oil. Office building: split system heating consisting of floor panels in gen-

eral offices, convectors in private offices. Heating and ventilation arranged to provide summer comfort cooling out of 54-deg. well water from own well. Color building: combination of radiation and heating and ventilating units. Cafeteria building: separate heating and ventilating units for cafeteria and men's and women's recreation rooms. Carpenter and maintenance shops, warehouse, box factory: unit heaters. Stereocraft: combination of panel heating and heating and ventilating units.

WATER SUPPLY

120-ft. well.

FIRE PROTECTION

100,000-gal. storage tank on 100-ft. tower. System of mains surrounds buildings, serving standard fire hydrants usable by fire departments of Portland or surrounding communities.

SEWER SYSTEM

Sanitary wastes collected in septic tank from which purified water is distributed into the ground by nine rows of pipe each 150 ft. long, buried two feet under the surface. Storm sewers collect drainage from roof downspouts, discharge into culvert passing under railroad tracks and thence into nearby stream.

PARKING

Lot holds 182 cars; additional space available next to Stereocraft building.

the boiler plant and compressor room, next to each other for convenience and better maintenance conditions.

Adjoining is a 15 x 15-ft. electric distribution building, containing the switching apparatus and the fusing. Power is distributed through a tunnel to the boiler plant and by a cross-tunnel to the warehouse building. Steam lines for heating travel partly through these tunnels and partly by overhead pipes under the peak of the roof of the covered walks. This system makes all the piping easy of access.

Because the company has a large number of small accounts, ample office space is requisite. Consequently the office building is 120 x 120 ft. in size, with the general office occupying 100 x 48 ft. of the space. The remainder is given up to the reception room, individual offices and lavatory facilities. Entrance to the building from the front is afforded by a small court.

Partitions between offices are of veneered hardwood plywood, and the 4 x 8-ft. panels are joined together by an aluminum fitting surmounted by a wooden trim. This construction not only provides attractive appearance and easy joining of panels, but also is inexpensive, the cost being only slightly more than ordinary plaster. Toilet

Faster Lift May Mean Fuller Purse

ALTHOUGH SPEED in operating fork-lift trucks is not a crucial factor in all plants, in warehouses and shipping departments where large volumes of pallet-loaded materials must be moved quickly, any acceleration of lift-truck activities naturally results in appreciable yearly cost savings.

Similar fork trucks often have different hoisting capacities. More important perhaps than weight and operational capacity of a truck, is the rated voltage of the power source for that truck. Since lifting speeds of battery-powered trucks are almost directly proportioned to impressed voltage for a given load, higher voltage will provide faster lifting speeds. It is not unusual to increase hoisting speed by 15 or 20 per cent on the basis of installing larger batteries.

For example, when a 5,000-pound truck is powered by a 30-volt industrial battery, it has an average hoisting speed of 29 fpm. with empty forks and 14 fpm. when loaded to capacity. However, when a 36-volt power source is installed in this same truck, it will

lift its unloaded forks at 34 fpm. and capacity loads at 18 fpm., representing a 17 per cent increase.

Similar possibilities exist for larger and smaller industrial trucks. The accompanying table lists average hoist-in speeds for 2,000- to 8,000-pound capacity trucks when powered by 30- and 36-volt batteries.

Because of greater weight and additional friction, speeds for telescopic trucks in second stages of hoisting are slightly less than the tabulated values.

FORK TRUCK HOISTING SPEEDS*

Truck Capacity in Pounds	Battery Voltage			
	30 Volts Forks Unloaded	30 Volts Forks Loaded	36 Volts Forks Unloaded	36 Volts Forks Loaded
2,000	33	26	38	30
3,000	33	25	38	29
4,000	33	22	38	26
5,000	29	14	34	18
6,000	29	13	34	17
7,000	20	11.5	24	14
8,000	20	10	24	12

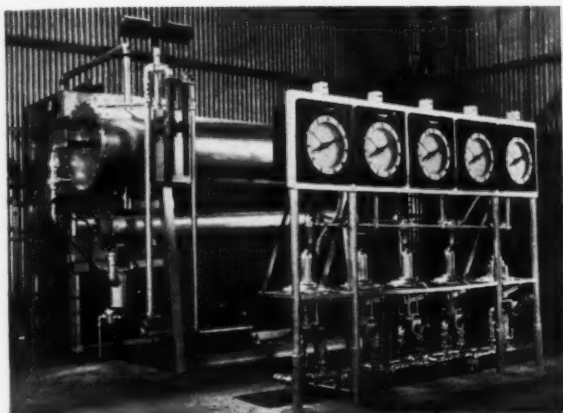
*Hoisting-speed values for these battery-powered fork trucks are in fpm. (feet per minute).

Courtesy The Mercury Manufacturing Co., Chicago

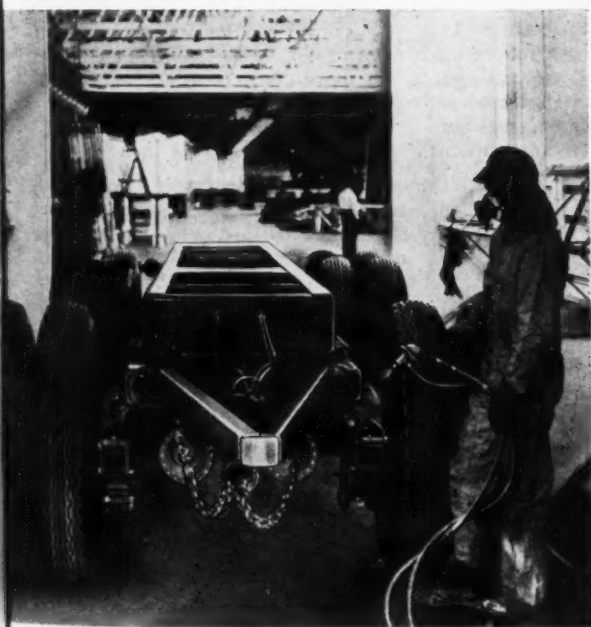
WESTERN PROCESSES AND PRODUCTS

in

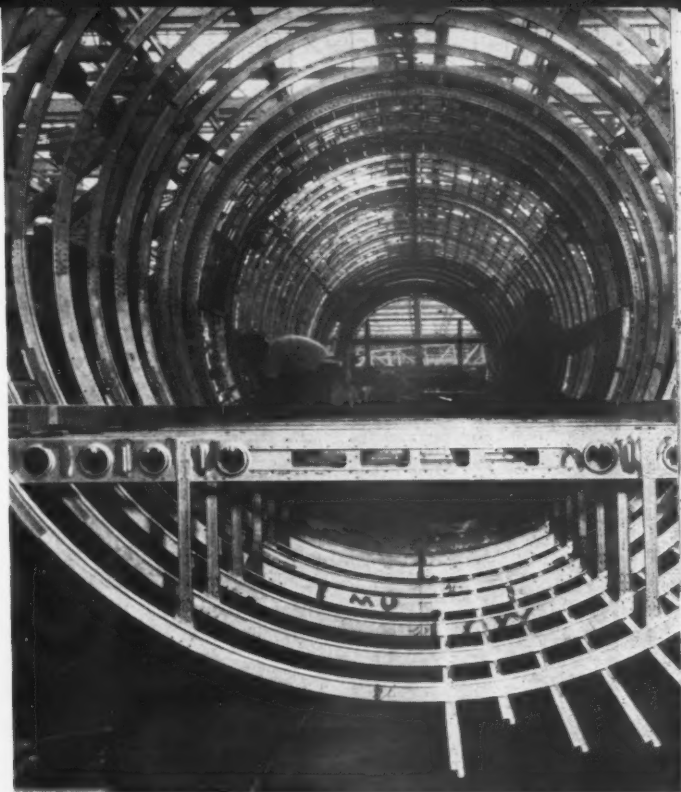
Today's View



ANNEALING CAPACITY of Calstrip Steel Corp., L. A. is increased 42% (to 65 tons per day). Controlled atmosphere generator shown supplies deoxidizing gas to the furnaces. Control units and recorders are in foreground.



PAINT PRETTIES UP the underbody of these new Fruehauf trailers while preventing damage from the weather and other elements. Here at Fruehauf's West Coast plant, new units are sprayed in a water-wash paint booth.



METAL MOCKUP of new Convair 340, 44-passenger liner, latest model. Dimensionally accurate metal construction simplifies solution of interior design problems. Previous Convair mockups were made of wood.



NEW CECO DROP HAMMER, 5,000 lb., doubles size of precision forgings obtainable on West Coast at Arcturus Manufacturing Corp., Venice, Calif., currently the only manufacturer of forged parts for Ford Motor Co.



Here comes a . . .

ROCKET-POWERED HELICOPTER

*. . . that will enable military
men to rise to any occasion . . .
and make Buck Rogers look
up (to) California designers.*

LEONARDO DA VINCI would open both of his eyes—real wide—if he could only see what modern man has done to improve on his original idea of a helicopter. Here is one of the latest models, rocket-propelled, designed for military use.

This craft, called the "Pinwheel," has been developed for the Office of Naval Research by Rotor-Craft Corporation, in Glendale, California. Pinwheel, the world's first rocket helicopter, comes under the class of "fantastic weapons" forecast by President Truman a few weeks ago. Here is some information concerning it:

Mighty Midget

It weighs less than 100 lb., is small enough to be parked in a space no larger than the top of an office desk, and has higher performance for the load it carries than any helicopter ever built. It will climb at a rate never before held possible for the "twirlies."

Liquid fuel rockets, self-starting and throttle-controlled, are mounted in the tips of two small rotor blades. The rotor is attached to a steel tube that curves downward to support fuel tanks, a pilot's seat, and a cargo hook. A tube extending backward from the rotor hub carries a small rudder, and another extending forward and down is the pilot's control column. That's the Pinwheel.

"It is the nearest approach that has been made to strapping a pair of rockets upon the back of a man and shooting him into space in Buck Rogers fashion," says Gilbert Magill,

president of Rotor-Craft and designer of the weapon. When your editor visited Mr. Magill a short while ago, he indicated that big things were in the wind in the helicopter business, but that security regulations did not permit him to divulge much basic information. That is the reason that a photograph cannot be released at this time; it is also the reason why performance figures are not yet available on this craft.

Magill says, however, that the Pinwheel packs more power, for the load that it carries, than any helicopter ever built, and that it can land and take off in high mountain areas heretofore inaccessible to any aircraft. With power off, it can glide like an airplane or descend vertically like a parachute. Its rocket motors display no flame, and in approaching an enemy location at night, it would be next to impossible to spot the darting little machine and its pilot.

Flights of Fact

Your editor has been considerably interested in the "little man's" helicopter since the days, years ago, when one Mr. Pentecost of Seattle, Washington (as we remember) was publicized in the press as having designed and built a small personalized helicopter that he fastened on his body in a manner somewhat to the Pinwheel.

Pentecost's craft, later models of which are called "Hoppi-Copters," was originally designed with an arrangement that looked like an outboard motor upside down. The pilot's

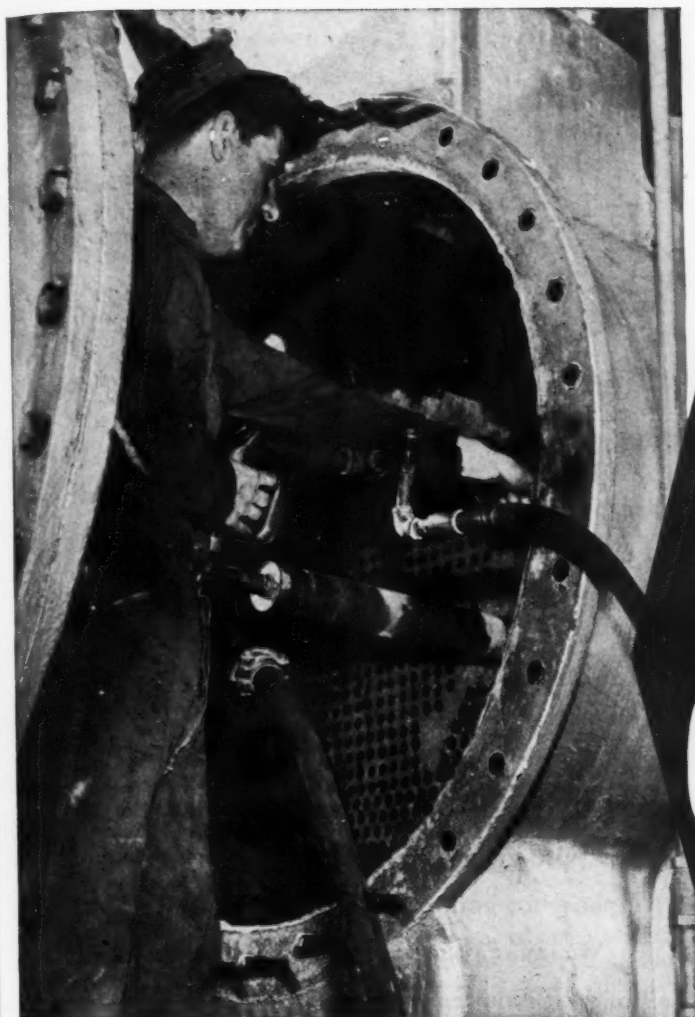
legs were the landing gear. Later models of the same craft grew a tripod landing gear, then wheels. What started out as a conventional rotor has graduated into a co-axial unit now.

Then Stanley Hiller, in Palo Alto, California, culminated years of experiment when he came out with his "Hornet" earlier this year, a ram-jet powered two-place closed helicopter. Hornet was originally designed for civilian consumption, but intervention of the Korean incident put a crimp in that plan. At the moment, the Hornet is possibly in military use—or its descendants will probably be there.

Where But Up!

American Helicopter Co. in Manhattan Beach, California, came out last year with a pulse-jet helicopter called "Top Sergeant." Now, this year, a model called "Buck Private," also a ram-jet craft but one-place, has been announced.

Other small helicopters—both internal combustion engine-powered and jet-powered are either on the drawing boards in the Western States, or in actual test. We have seen some of them. And we are frank to say that we are not quite amazed when a new design like this Pinwheel comes to life. After all, with so many fertile brains at work on this single project in the West alone, what else is to be expected? We predict, as did Gilbert Magill, that big things are in the wind for the helicopter business; it's on the ground solidly right now, and can't help but go up.



Condenser
Tubes
must be...

**KEPT
CLEAN**

Newport shoots the brushes through the tubes with an air-water gun at 75 lbs. per sq. in. They come from the far end like projectiles. Another Revere contribution was to assist in the design of a target to stop the brushes without damage.

● Condenser tubes almost immediately acquire a film that protects the metal from corrosion. Such film is thin, and beneficial. If it does not form, the probability is that the wrong alloy has been selected. It is part of Revere's service to collaborate with you in selecting the alloy that will be most economical in the long run.

There is another and much heavier type of formation within a tube that impairs its operation, or shortens its life, or both. This is the deposition of foreign matter such as shells, which may cause erosion-corrosion effects, and the growth of organisms such as algae. The latter materially reduce heat transfer.

Take the case of the Newport Electric Corporation, Newport, R.I. Its condensers are cooled by harbor water, with the result that algae and other marine organisms coat the tubes, reducing efficiency, lowering the vacuum, and increasing fuel consumption.

This utility is exceptionally well managed, with a systematic tube-cleaning program. However, it found that brushes and rubber plugs used for cleaning wore out quickly. Revere took a close interest in this problem. One of Revere's customers makes nylon brushes for cleaning tubes in dairies, and it was suggested that

a modification of these be tried. Results: over 300 tubes cleaned per brush, a much longer life than anything previously used, and a half-inch gain in vacuum, meaning dollars and cents saved in fuel.

Revere makes condenser tubes and plates in all the usual alloys, and is glad to collaborate not only in specification, but in other condenser problems, as this case history shows. We are only too glad to work with you on any matter involving condenser and heat exchanger operation. Our wide experience, and contacts with many industries will be made freely available to you. Write the nearest Revere office.

REVERE *150TH YEAR OF
SERVICE
TO AMERICA*
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—
Sales Offices in Principal Cities, Distributors Everywhere.*

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We've built

new facilities

for your production!

Many manufacturers who need increased production are using Valley's expanded capacity for both prime contracts and sub-contracts.

We invite you to join them. Let us produce all of your requirements, or part of them...

Send us your plans, or let us help you engineer special plans. We're easy to work with—and we deliver every order *on time!* Complete facilities, now being more than doubled, are manned by trained crews experienced in machine shop, fabrication, welding and assembly work.

Write, wire or telephone.

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One man with a steam gun can do as much maintenance cleaning as eight with brushes and buckets. Degassing the inside of an oil truck before welding (right) is one example, and there are hundreds of other examples, of how . . .

STEAM CLEANING

cuts labor costs in maintenance

KANSAS CITY'S recent flood gave a wholesale demonstration of steam cleaning's effectiveness. Our plant alone shipped more than 80 steam cleaners into the city to remove flood-borne silt, oil and debris from machinery, buildings, floors, vats, etc., and put industry back into production quickly.

Spectacular? Yes, but a flood isn't needed to make steam cleaning worthwhile, as a number of Western industries already are proving.

Steam cleaning to save time on repairs is an old story to auto repair men. They estimate that steam cleaning engines and parts saves 40% of a mechanic's time on overhauls; the time that otherwise would be spent wiping off grease and dirt. Industry can make similar savings with steam cleaners, both on maintenance and production.

One Man With a Gun . . .

Studies show that one man with a steam gun can do as much maintenance cleaning in an hour as a man with a brush and bucket can do in eight to ten hours. And steam cleaning does a better job, too, because it gets into out-of-the-way corners, behind posts and under machines—places workmen can't reach with a brush or are inclined to slide over.

Western Die Casting Co., Emeryville, California, finds its small cleaner enables one man on Saturdays to do all maintenance cleaning, a job that formerly required three men using the "brush and bucket" method. Roy Dahlberg, head of the maintenance

By **WALTER F. MALSBAR**

Malsbary Manufacturing Co.
Oakland, California

department, says his Malsbary steam cleaner does a more thorough job and at the same time reduces danger of fire hazards.

Clean Up for Safety

Industrial fire losses increased 68% in the last ten years (*Western Industry*—July 1951). A considerable portion of this loss doubtless was caused by fires starting in the grease that splashes and drips from machinery onto walls and floors. To remove this grease, many plants use inflammable cleaning fluids, thus multiplying the fire hazards. Steam cleaning gets rid of fire-breeding grease by pressure and hot solution—no inflammable fluids are required.

Greasy, slick floors also endanger personnel. The National Safety Council reports 37 men hurt or killed every day in 1949 from falls alone. Many plants know this—so they install skid-proof floors. But no floor is skidproof when coated with oil. So, by steam cleaning grease off floors you promote safety two ways.

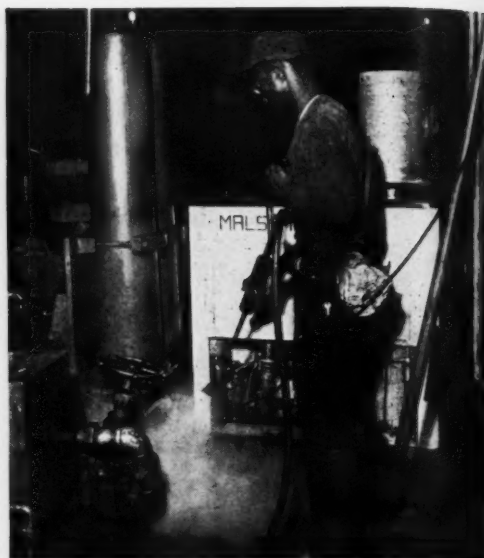
Improve Sanitation

Canneries and meat packers naturally have to clean up every day for sanitary reasons. At Kaufmann Meat Co., San Jose, the job of cleaning animal fats from floors, tables, conveyors and equipment was an all-night task with buckets, brushes and hot water from a makeshift boiler. Now one man does the job in about a third of the time with a steam cleaner. He has been able to thoroughly deodorize and sterilize, too, because steam pressure

—All photos courtesy Malsbary Mfg. Co.

REMOVING CUTTING OILS from valve housing before painting at Nordstrom Valve Division, Rockwell Manufacturing Co.





TO REMOVE GREASE, cutting oils, rustproofing, etc., from lathes and other heavy equipment before repair work is begun, Union Machine Works uses a steam cleaner (left). Western Die Casting Co. uses a portable set-up to steam clean machinery and floors (right). Unit also cleans grease and muck from dies before inspection.

forces hot solution into corners and crevices at temperatures up to 212 degrees.

Speed Production

The same steam pressures and high-temperature solutions that remove grease from floors and sterilize equipment, can be profitable on the production line, or so the Nordstrom Valve Division of Rockwell Manufacturing Co., Oakland, Calif., has found. This division makes high pressure valves, some up to 30 in. in diameter.

A stationary steam cleaner is kept busy two and three shifts a day cleaning cutting oil and heavy grease from the machined valves, castings and parts before painting and final assembly. Frank Boomer, Assembly Foreman, says he could scarcely get along without a steam cleaner. Nordstrom Valve also uses another smaller, portable steam cleaner for maintenance cleaning of lift trucks, machinery, floors and walls.

How Steam Cleaning Works

All steam cleaning depends on pressure and water, preferably hot soapy water. A steam vapor cleaner is simply a device to provide hot soapy water under pressure and direct it where needed. It consists of five main parts: pump, solution tank, heater coil, burner and outlet gun. The pump forces water, into which soap or detergent is metered, through a continuous coil where the solution is heated instantaneously. Some of the water flashes into steam and expands to give the necessary pressure. Hot solution

(about 190- to 200-deg. F.), under pressure of 50-100 pounds per square inch, is aimed with the gun and washes away dirt, grease, oil or tar.

Industrial cleaning is much like washing your hands; the dirtier they are, the more pressure, soap and water you need. Steam vapor cleaners, with a practical pressure limit of about 90 psi., will handle most industrial cleaning. For tougher, heavy-duty cleaning jobs, we have developed high pressure cleaners that deliver hot solution (to 325-deg. F. in the coils) up to 400 psi. with hourly capacities ranging from 2 to 20 times that of steam vapor cleaners.

Choosing the Right Size

No hard and fast rule can be laid down, but in general, smaller models are best suited to cleaning floors and walls, machinery and parts, indoors. The high-pressure, heavy-duty models are chiefly used to clean large construction equipment, heavy machinery, large trucks and building exteriors. Where speed is vitally important, as in the cleanup after the Kansas City Flood, the heavy-duty models are worth many times their extra initial cost, because the greater the pressure and volume, the shorter the cleaning time.

Cleaning jobs requiring continuous operation eight hours or more a day by smaller steam vapor cleaners, can be done in a half or quarter of the time by the larger, high-pressure cleaners—a real labor saving. However, the indoor usefulness of these larger steam cleaners is limited by the drainage

facilities available. Some of them deliver as much as 2,100 gallons an hour.

Locating Your Cleaner

Drainage, of course, is a problem in all steam cleaning. Even small cleaners put out about 100 gallons an hour. A waterproof floor is essential. Concrete slab floors are best: asphalt or tar compounds quickly soften to a mush if exposed to hot cleaning solution. The blast from even a small model cleaner can cut through asphalt paving in a matter of minutes.

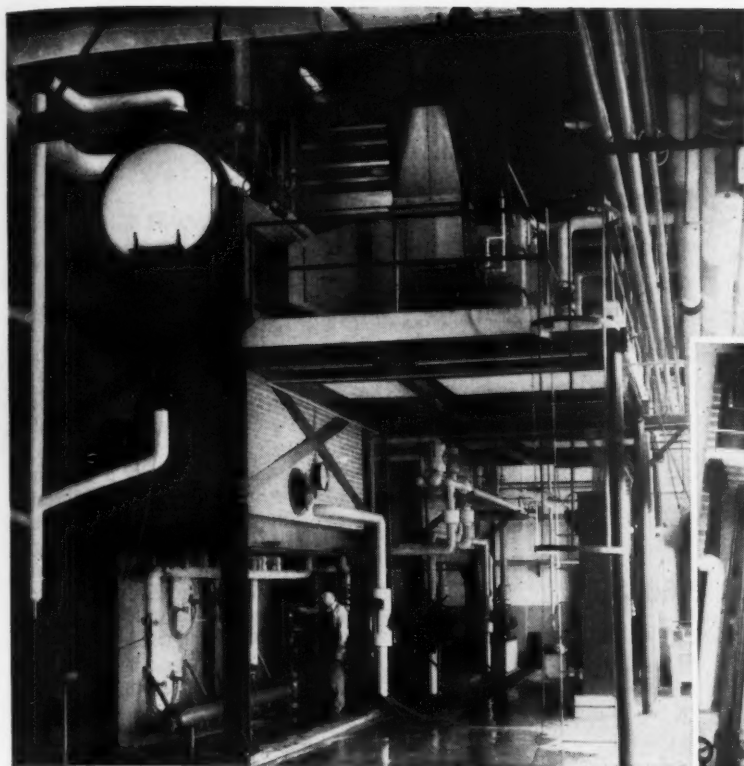
Steam cleaners also need some protection from the elements, especially where freezing temperatures are found. Portable or trailer-mounted cleaners can easily be left indoors for the night, but large heavy duty models, usually used outdoors to clean mobile equipment, must be protected with a shelter that is heated in cold weather or drained nightly.

Good cleaning depends also on good lighting. An operator can't be expected to clean dirt and grease he can't see. If possible, a special area, with all the above requirements—drainage, waterproof floor, good light and shelter—should be provided. Many new plants have such areas included in the original plans.

Cleaning Compounds

What cleaning chemical to use depends on the surface to be cleaned, cleaning speed required and the location of your steam cleaner. There are compounds for every surface, whether aluminum (never use caustic on alu-

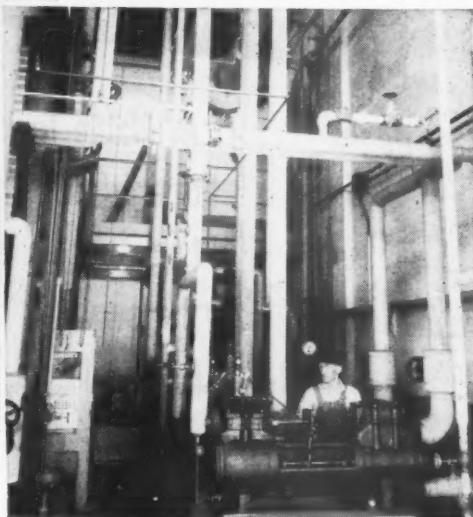
Concluded on page 50



INSTALLATION:
CALIFORNIA PACKING CORP.
Plant No. 3—San Jose, Calif.

LEFT: Boiler room view of Fiberglas PF (Preformed) Pipe Insulation, finished with fire and water treated canvas, on all boiler feed-water lines for 500,000 lbs/hr. steam boilers.

BELOW: Fiberglas PF Pipe Insulation on boiler feed-water lines and Fiberglas PF (Sheet) Insulation on deaerating tank maintained at 220° F. temperature.



FIBERGLAS* Pipe Insulations...

Reduce Costs for Food Processing Industry

In a wide range of applications throughout industry, including food processing, Fiberglas PF (Preformed) Pipe Insulations are keeping fuel and maintenance costs down. Consider their *unique* combination of fine performance qualities:

- High insulating value
- Incombustible
- Moisture resistant
- Sanitary—provide no sustenance for bacteria or vermin
- Won't rot or decay
- Easy to apply
- Non-corrosive

Savings in operation cost result from Fiberglas Pipe Insulation's high thermal efficiency. Thermal conductivity (k) equals 0.24 at 75°F. and permits fine temperature control with a minimum of fuel consumption.

Made of ageless fibers of glass, Fiberglas Pipe

Insulation provides long-life protection and low maintenance cost. Durability, combined with its extreme light weight, also makes possible rapid, low-cost installation for outdoor and indoor applications.

In pipe sizes from ½" to 30" and forms suitable for low and high temperatures up to 600°F., Fiberglas PF Pipe Insulations are available through distributors and applicators located in every principal city throughout the ELEVEN WESTERN STATES.

For name of your local Fiberglas applicator or further information, phone the Fiberglas branch office nearest you, OR write to Owens-Corning Fiberglas Corporation, Dept. 113-K, P. O. Box 89, Santa Clara, California.

PACIFIC COAST DIVISION SALES OFFICES: Albuquerque, Denver, El Paso, Eugene, Fresno, Los Angeles, Phoenix, Portland, Sacramento, Salt Lake City, San Diego, San Francisco, San Jose, Seattle.

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Available to industry operating in the Los Angeles area are the services of California Bank, a business-minded bank, with complete facilities for industrial accounts.



California Bank *Los Angeles*
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

STEAM CLEANING ...

... begins on page 47

minum), concrete, stone, various painted or enameled surfaces, steel and so on. A sound rule—take the advice of a reputable compound firm with a complete line.

Using a Steam Cleaner

Steam cleaning is a simple process. Any average man can clean fast and thoroughly with a steam cleaner after a few minutes instruction. If the machine and cleaning compound have been well chosen, he simply points the gun at something dirty; in a few seconds it's clean. Heavy duty models, with their various combinations of cleaning actions, call for a little more judgment on the part of the operator.

For floor and wall cleaning it is best to use a flat nozzle in the steam gun.

To strip paint, first spray or wash the painted surface with a paint stripper recommended by your chemical supplier. Wait a few minutes for the paint to peel up and wrinkle. Then wash off with hot solution from steam cleaner.

See for Yourself

Our experience indicates that steam cleaners reduce both maintenance and production cleaning time; improve plant safety and sanitation; decrease fire hazard, and are simple to operate. If you have any doubts about what they can do for you, ask for a demonstration in your plant.

Machine Improved For Sugar Cubing

AMALGAMATED Sugar Corp., in Idaho, will shortly have in operation a new machine designed especially for cubing sugar. Complete modernization of the famous Hersey Sugar Cubing machine, standard equipment in the industry for years, is now completed by Standard Steel Corp., of Los Angeles.

Since the acquisition of the Dryer and Sugar Machinery Div. of Hersey Mfg. Co., Boston, by Standard Steel Corp., Standard Steel engineers have been working out and field testing numerous improvements on the cubing machine, relating to increased efficiency, greater output, lower maintenance, and improved product quality through better contamination protection.

The entire machine is now chiefly fabricated from steel plate and minimizes the use of castings. Surfaces that come in contact with sugar are tinned after fabrication, to avoid contamination of the sugar.

WESTERN
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Here's Your Chance To Score . . .



Put WESTERN INDUSTRY's January, 1952 ANNUAL REVIEW & FORECAST ISSUE on Your National Schedule. Out January 10 . . . forms close December 10.

WHY THE JANUARY REVIEW & FORECAST ISSUE? Because its extensive, accurate editorial coverage of industry in the West will make it the hand-book of so many Western manufacturers—just as previous issues have been.

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RESOURCE, or NUISANCE?

**A COMPROMISE MATERIAL
between WOOD and PLASTIC**

Wood, waste and resin, has come from the laboratory to the production line to serve many purposes and tap a big source of supply.

By HERMAN MILLER

**IS YOUR PLANT
DIFFERENT?**

If you think work measurement techniques and an incentive plan can't apply to your manufacturing processes, you may be missing an opportunity to increase labor productivity.

By ALBERT J. HARRIS

**WHO
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WHERE?**

Everyone knows, all the time, with this work order form developed at Pacific Airmotive to keep track of progress on overhaul jobs.

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A way to grow lumber in the supplier's yard

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WHY THIS REGIONAL BOOK? Because truly "The West Is Different." Climate, terrain, natural resources, variety of agriculture, high purchasing power, unparalleled population growth—all add up to great industrial growth. Expansion by industry begets the need for improved and/or new production techniques, new machines—a multitude of wants to be satisfied.

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WESTERN INDUSTRY works at having a *live* circulation list.

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In the West, during the past decade

Population has increased 5 1/2 million.
Labor force has increased 80 percent.
Number of industrial plants has increased 45 percent.

Sources:
1950 Census of Population;
'47 Census of Manufacturers.

No need for additional personnel in this—

Improved Receiving Department

A SUBSTANTIALLY INCREASED business volume made it necessary for Pacific Airmotive Corp., Burbank, Calif., to redesign its receiving department. Under a new system, which requires no additional personnel yet greatly reduces fatigue for those already employed, PAC is able to clear all incoming materials to designated areas within 24 hours of receipt.

This is accomplished by employing 1,250-lb. capacity flat trucks for heavy consignments and 100-lb. capacity trucks, 30 in. high, for smaller, lighter items. Company has 15 of each type. Guide rails, buttoned to floor, keep trucks in orderly lines and assure natural rotation of incoming material. One truck line, however, is kept open for rush handlings.

Within the receiving room, numerous stations have been set up, serviced by several men, each with simplified duties. One of these men receives the material, pulls master purchase order, matches it with consignment packing slip, and routes material to flow lines. Two other men open packages and check quantities against packing slips. Still another writes "variable masters" for material before it is submitted for inspection.

After material is inspected, additional "receiver copies" are run off, and material is moved into distribution area where it is put in designated place by means of fork lifts.

This routine not only increases production, thereby cutting costs, but it also keeps workers' morale high by eliminating most of the fatiguing operations of handling, stooping and lifting encountered in many receiving systems.

Protection for Stainless Steel

AN INTERESTING aspect of stainless steel fabrication is the method used by different firms to keep it clean while undergoing processing. At Standard Steel Corp., Los Angeles, workmen thoroughly scrub stainless steel plate as it is received from the supplier, to remove any possible chemical contamination. Then they apply a spray coating of a rubber-like compound, which stays on the surface all through the stages of fabrication.

Just before shipment, the protective coating is removed and the fabricated vessel or pipe is sealed to prevent any contamination in transit.

THE RECEIVING END of the Receiving Department. Note that the trucks, trash cans and desks are on wheels, and that the smaller items are on the "bench-height" trucks.



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You can reduce water costs with— EFFICIENT COOLING TOWERS

Here is a complete survey of the principles involved, types of towers and their structural features, and advantages and disadvantages

THE FIRST DEVICE for recooling water by means of evaporation was the open pond. Here, the water was pumped to an open basin and allowed to cool by evaporation from the flat surface. Incoming hot water is of lower density than that already in the pond and spreads over the top of the pond, assuring a more rapid cooling than if the waters were mixed.

At present such an arrangement is still in use, particularly where there are natural lakes. Where power plants or industries are sufficiently close to lakes, an arrangement for their use as cooling ponds should be seriously considered.

Sprays and Splashes

Use of artificial ponds requires a large area of land, which is prohibitive in most cases. In order to increase the effectiveness of cooling, sprays were incorporated which disintegrated the hot water stream into many drops a few feet above the pond or basin. This re-



By

**DR. N. W.
SNYDER**

Technical Adviser for
Santa Fe Tank
and Tower Co.,
Los Angeles, Calif.

duced the ground area somewhat. The method is still feasible in many instances, particularly when considering the first cost and maintenance of equipment.

For the large heat loads required in the newly expanding oil and chemical industries of the first quarter of this century, equipment was needed which could cool the water over a large range of temperature.

The atmospheric tower was thus introduced, which operated on the basis of water being injected by means of sprays or splash devices at heights

from 10 to 60 ft. above the basin and allowed to fall freely or over slats while being contacted by winds blowing through. Louvers were introduced to prevent excessive water entrainment, resulting in a form which is even used extensively today because of certain advantages which will be mentioned later.

Chimneys and Towers

Another form of atmospheric tower is one in which the air flow is induced by a chimney stack over the tower. Although it was used in this country in the 1920's, it has practically disappeared. However, several of the oil refineries and power plants have made extensive use of it in England and other European countries.

These towers are being built as a concrete shell over 300 ft. high and almost 300 ft. in diameter. Because of the relatively small change in density of air in becoming humidified, this tower would be of no use in hot dry climates.

During the last 20 years and particularly in the last decade, the mechanical draft tower has become highly popular. As will be explained, it yields a more constant and efficient type of operation.

Basic Principles

Designs of many towers, particularly the larger-sized variety, are being based upon dubious field tests. Purchasers of towers have acquired them on occasion by the sales appeal rather than technical design and performance. Few engineers, and this includes many in the cooling tower manufacturing field, have a basic knowledge of the mechanism of fluid flow and heat transfer in evaporative cooling equipment.

No attempt will be made to present the theory, but a few basic principles will be stated which are not much more than a nomenclature. A technical résumé will be available in the near future and a note to the author requesting a copy when finished is welcome.

Cooling of water in an air stream is

WASTING WATER IS EXPENSIVE

ALTHOUGH there is a plentiful amount of water in the West for various industrial purposes, it is not all available at the present nor in the proper locations when available. Programs in dam construction and water ways are being completed to supply many of the Western States with water needed for industrial expansion. Hawksley¹ indicates that from 23 to 54% of the water taken by plants is used for cooling. When used in a once-through manner this amounts to a great waste.

Recirculation of water through a cooling tower will result in a large saving of water. One per cent of evaporation will cause an approximate cooling of 10 deg. F. Not to be discounted, however, is

the heat transfer due to the difference in temperature between water and air. Where the ambient air is hot and dry, this value may be negative, that is, the water may be cooler than the air with evaporation supporting both the cooling of air as well as water.

An unlimited recirculation of the water is not possible because of the concentration of solids as water is evaporated. Depending upon the type of water available for make-up, tower bleed off may amount to as much as 50% and as low as 3%. The bleed off may be maintained at a low percentage by chemical treatment of the tower water.

¹R. W. Hawksley, *Western Industry*—May 1951.

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The greatest advancement in welding torch design and construction was made when NATIONAL engineers developed and patented the better way of making an effective, leakproof, damage proof joint between mixer and welding torch head; between cutting attachment and torch butt.

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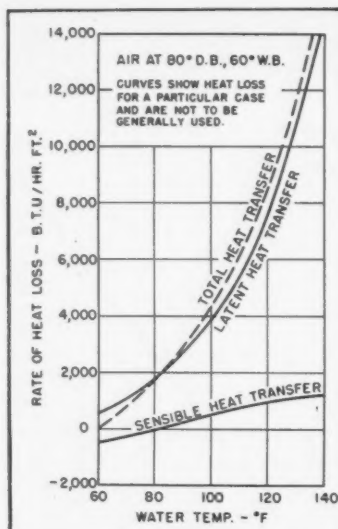


FIG. 1—Example of heat loss from water due to evaporation and temperature difference.

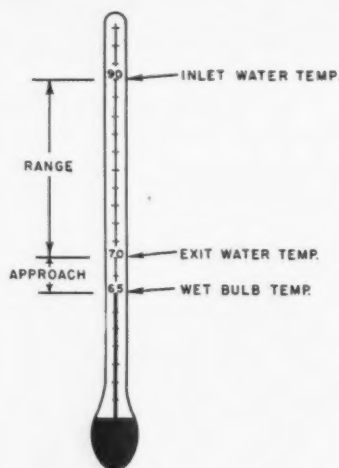


FIG. 2—Schematic explanation of definition of range and approach.

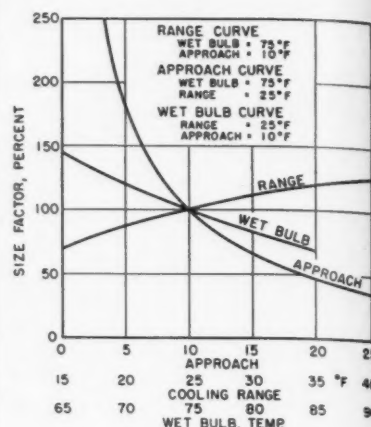


FIG. 3—Effect of range, approach and wet bulb on size of tower.

accomplished primarily by the evaporation of water. That due to evaporation is named latent heat transfer (water body supplying the latent heat of evaporation), and that due to the temperature difference between water and air is named sensible heat transfer. The latter can actually be negative when the air is actually hotter than the water. Figure 1 shows the relative magnitudes for these quantities in a typical example. At the point where the negative value of sensible heat transfer is equal to the latent heat transfer, the net rate of heat loss is zero and the water is at its lowest possible temperature. This temperature is referred to as the *wet bulb*. It is so called because one may determine it by placing a thermometer with its bulb encased in a wet wick in the stream of air to be analyzed.

The *approach* refers to the difference in temperature between the water leaving the tower and the wet bulb temperature of the entering air. The *range* is the change in temperature of water passing through the tower. Shown in Figure 2 is a schematic explanation of these principles on a thermometric scale.

Variables

Transfer of heat from the water to air inside a cooling tower depends upon several variables. One is the geometry of tower which involves the height of fall of water and the surface area of heat transfer. The latter is controlled by the use of sprays for disintegrating the water and by slats which are continually wetted and impede the progress of water drops, thus preventing

them from passing out of the tower too quickly.

Another variable is the air velocity through the tower. With higher air velocities, more air contacts the water and the resistance to heat transfer at the water surface is reduced. A third variable includes the relative difference in temperature between water and air and the difference in humidity between air saturated at the water surfaces and air in the main air stream.

The effect of approach, range and wet bulb upon the size of the tower is shown by the example in Figure 3. For a given range and wet bulb, the size of a tower increases very rapidly as the approach is made much less than 10 deg. F. An economically designed tower usually operates with an approach between 5 and 10 deg. F. Effects of range and wet bulb are also given.

Types of Towers

Spray Cooler: The simplest type is a *spray cooler* which consists of a system of sprays at the top of a louvered enclosure. This tower has no fill or packing inside and the passage of water downward toward a collecting basin induces an air flow from the top downward.

This sort of arrangement is very ineffective with the approach being large and the range small. Recirculation of the moist exit air usually occurs. Its advantage lies in low initial and maintenance costs.

Atmospheric Tower (Cross Wind): This tower is furnished with either up-spray distribution or trough distribution at the top of the tower, and the

water cascades over a system of decks as it falls to the basin. The wind enters through louvers on the windward side of the tower, and leaves from the leeward side.

These towers can be designed for zero wind velocity, in which case the heating of the air inside the tower by the warmer water causes it to rise and draw more air in through the louvers, thus acting much like the chimney draft tower. The advantages of this type of tower are:

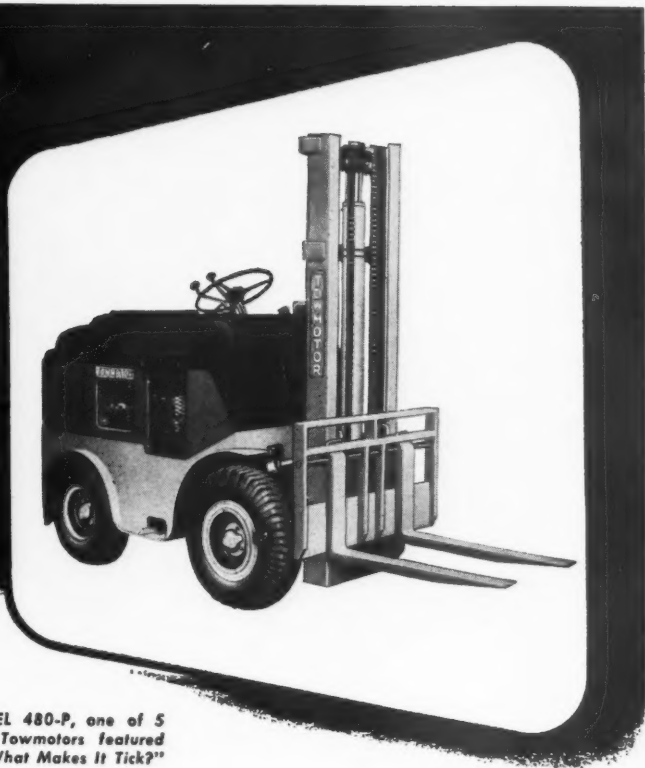
1. Dependability: No mechanical parts precludes shut-downs due to failure.
2. Low maintenance costs: The lack of mechanical equipment means no lubrication, painting, checking, etc.
3. No recirculation: Since air enters on the windward side only, the possibility of recirculating the spent exhaust air is eliminated.
4. Colder average water temperature: Since the average yearly wind velocity is higher than the design velocity, the average cold water temperature is lower than in the corresponding mechanical draft tower.

The disadvantages of this type of tower are:

1. Length: Since it is not usually feasible to design these towers for a width greater than 12 ft., the tower must be very long if handling large quantities of water.
2. Pumping head: Greater pumping heads are required than in mechanical draft towers for the same performances because of greater heights needed.
3. Fluctuating water temperatures: Since wind velocities are seldom constant, cold water temperatures also fluctuate.
4. Spray loss and "fogging": The wind blowing through the tower creates spray loss and "fogging" on the leeward side which is often detrimental to nearby equipment.
5. Location: These towers must be in an unobstructed site, necessitating location either on a roof or away from buildings, com-

Continued on page 58

**Good News for
EXECUTIVES**
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COOLING TOWERS

... begins on page 54

sequently requiring longer pipe lines and higher pumping heads.

Mechanical Draft Tower: Operation of these towers depends upon an air flow produced by fans. They may be either of the packed or spray-filled type, with the former usually proving to be the smaller and more economical unit. The disadvantages of this type of tower as compared to atmospheric types are:

1. Horsepower expenditure for the fans.
2. Greater initial and maintenance costs due to fans, gears, bracing.
3. Subject to mechanical failure.
4. Subject to recirculation of the spent air back through the intake louvers, which raises the wet bulb temperature of the inlet air.
5. Winds affect the performance with larger air intake area types of towers being affected more so.

Advantages are (and they more than take care of the disadvantages):

1. Closer control of exit water temperatures.
2. Smaller ground areas.
3. Lower pumping heads.
4. Greater fill or packing densities are possible because air flow is maintained mechanically.
5. Closer approaches and larger ranges are possible.
6. Location of the tower is not particularly restricted.
7. Moist air and entrained water are pushed up into the air instead of along the ground.

Two Kinds of Draft Towers

There are two classifications of mechanical draft towers; induced draft and forced draft. The induced draft tower has the fan assembly mounted on top of the tower, drawing air through the tower and exhausting it at high velocity out of the fan stack.

The forced draft tower has the fan assembly located at the bottom of the tower, forcing air into the bottom of the tower at high velocity and exhausting it at the top with relatively low velocity. Due to this low exhaust velocity and high intake velocity, there is a tendency for the humidified exhaust air to cause considerable recirculation.

In an induced draft tower the fan equipment is located in the humid exhaust air stream, necessitating some concern with regard to corrosion and water in the lubricants. However, much less recirculation of the exhaust air may be relied upon. This tower has been almost universally adopted in the United States. A further subdivision occurs with two types of induced draft towers, counterflow and cross-flow.

Cross-flow Type: This tower is furnished with a distribution system at the top of the tower, usually consist-

ing of an open hot water distribution basin over the packed section which is provided with holes through which the water falls onto the packing.

The single cross-flow tower is provided with a fan located on one side of the tower drawing air horizontally through. The disadvantage of this arrangement is that the humid air is exhausted in a horizontal direction, rather than upward and away from the surroundings.

For this reason any large amount of air exhausted horizontally in this manner is liable to have an adverse affect on surrounding equipment. Consequently, single cross-flow units are not usually built larger than the small packaged sizes used mainly for the air conditioning and refrigeration industries.

Double Cross-flow Tower

Another arrangement is the double cross-flow tower, Figure 4, provided with a fan at the top center of the tower drawing air from both sides somewhat horizontally through the packed sections into a plenum chamber under the fan and then ejecting this air vertically. This does away with the undesirable effects of horizontal exhaust.

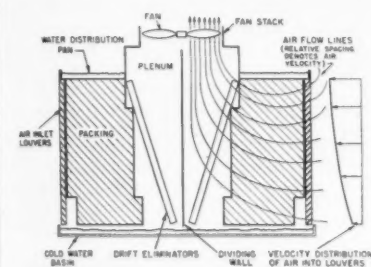


FIG. 4—Schematic representation of the double cross-flow tower.

The advantages of the cross-flow type of tower are as follows:

1. Low pumping head: Since all air is drawn through the sides of the tower, no intake chamber must be provided between the bottom decking and the basin. The packed section may be built lower to the basin water level, resulting in a lower distribution system and consequently a lower pumping head.
2. Low fan static pressure: With air drawn in over the entire tower height, the air intake velocity is lower than for the counterflow type where the intake area is relatively small. This lower velocity is manifested in a smaller static pressure across the intake louvers.
3. Accessibility of distribution system: These towers are usually furnished with an open basin for distributing the water and can be cleaned from the top, even while the tower is in operation.

The disadvantages of this type of tower are:

1. Lower effectiveness: The cross-flow arrangement is not as effective in cooling as the counterflow arrangement, this effective-

ness falling off rapidly by as much as 25 to 30 per cent as the approach to the wet bulb is decreased and the range increased.

2. Clogging of distribution system: Since there is less than a foot of water above the nozzles in the distribution basin, the velocity of the water through these nozzles is not great enough to prevent clogging.

3. Algae growth in distribution basin: With the distribution basin exposed to the direct rays of the sun, algae formation is often rapid.

4. Large collecting basin area: Approximately 40 per cent of the tower width is used for the plenum chamber, the basin must be made larger than is required for the active portion only of the tower.

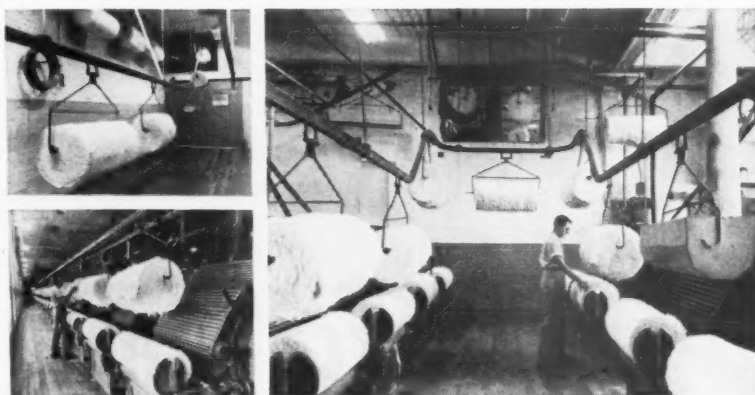
5. Inaccessible collecting basin: Since the decking is built down to the water level, it is necessary to provide a deep basin with piers to elevate the tower posts and provide for access in cleaning and maintaining the basin.

6. Uneven air distribution and recirculation: Since the upper portion of the intake louvers is nearer the fan, a greater proportion of the air enters at the top, whereas the lower portion of the tower where the close approaches to the wet bulb must be attained receives the least amount of air.

With the high air intake velocity at the top of the louvered area (see Fig. 4), recirculation of spent humid air is found in

Continued on page 60

RAISE production...LOWER costs



Photos: Courtesy Springs Cotton Mills

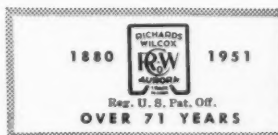
with "Zig-Zag" Continuous Power Conveyors

Here you see how "Zig-Zag" solves a complex handling problem in the Springs Cotton Mills at Lancaster, South Carolina. In almost every imaginable industry, R-W "Zig-Zag" Conveyors are serving production and processing lines—increasing efficiency, cutting costs. Specifically designed to carry light loads through confined or crowded areas, "Zig-Zag" is adaptable to almost every plant condition or layout. And the savings effected with R-W "Zig-Zag" Conveyors are so substantial, the equipment pays for itself quickly—in most cases in less than a year! For further information, call, write, or wire our nearest office.



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COOLING TOWERS

... begins on page 54

cases where there is a cross wind across the tower. This effect becomes more pronounced the taller the tower.

7. Wind effects: A wind blowing across the tower causes a partial vacuum on the leeward side of the tower, thus reducing the air intake rate. Although air flow into the tower is increased on the windward side of the tower, the reduction is greater on the lee side and the over-all effect is a decrease in performance.

Counterflow Tower (Figure 5): This type of tower is furnished with a totally enclosed distribution system and

packed section. The distribution can be a spray system (either upspray or downspray) or trough system, located above the packed section. The spray system consists of a main header pipe, with lateral pipes to which the nozzles are attached.

The trough system consists of a series of troughs either with holes in the bottom, or with V-notches in the sides through which the water passes thence falling onto splash plates where it is disintegrated into drops. The V-notch system is usually preferable since it assures a more even water distribution

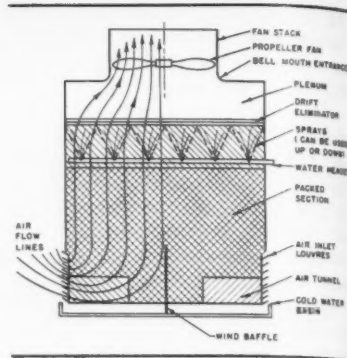


FIG. 5—Schematic representation of the counter-flow type of tower.

at low water circulations. The advantages of counter-flow type of tower are:

1. Cooling effectiveness: The counterflow type of arrangement is the more effective type of cooling than the cross-flow. One way of explanation is that the fresh air contacts the cold water where it is needed most in approaching the wet bulb. A closer approach to the wet bulb is then available.
2. Adaptability: Counter-flow cooling is adaptable to both difficult cooling jobs (high ranges and close approaches) and easy cooling jobs (low ranges and large approaches).
3. Uniform air velocities: Air is drawn from an open intake chamber beneath the packing and enters the packing with virtually a uniform velocity. This is more so for the taller towers.
4. Less ground area required: The plenum chamber below the fan is located at the top of the tower and the base of the tower need not be extended to accommodate this chamber; thus the entire base area may be utilized for the cooling portion of the tower.
5. Less adverse wind effects: Counterflow air intake louvers are smaller and located low on the tower. Winds blowing across the tower do not cause as great an effect as with the cross-flow.
6. Decreased recirculation: Since counterflow air intake louvers are located low on the tower, they are far enough from the fan exhaust to minimize the possibility of recirculating the exhaust air.

Disadvantages of the counter-flow type tower are:

1. Pumping head: Due to the location of the air intake chamber at the bottom of the tower, packing must be located higher in the tower resulting in higher pumping heads.
2. Higher entrance velocities: A higher air pressure loss occurs because of the smaller intake area causing a higher entrance velocity.

At this point it would be well to mention a late development in cooling towers of the counterflow type. This tower is built with a cylindrical cross-section, much like a tall wood tank. Air is drawn over the entire circumference at the base of the tower, thus increasing the cross-sectional area through which the air enters and enabling the intake height to be lowered (and consequently the packed section). This results in a saving in pumping head.

Air distribution through the tower

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is more effective, since the strength of the cylindrical shell eliminates the necessity for internal bracing with accompanying eddies and friction losses.

Some towers seem better suited to specific jobs than others. For easier cooling jobs, such as in certain oil refinery and certain power plant applications, the counterflow tower is the better choice.

In some applications, such as in the field of refrigeration, where being a few degrees off required performance is not too detrimental, and where required sizes are not usually unreasonable, the initial cost and high horsepower requirements of the mechanical draft tower may eliminate this type entirely in favor of the atmospheric tower.

For high performances and small loads where the location area is restricted to roof of buildings or cellars, the ready made, packaged and densely filled crop or counterflow tower is chosen.

Structural Features

A flimsily constructed tower may have an advantage in first cost, but the resulting troubles will be reflected in increased maintenance costs and poorer performance. The purchaser should evaluate the tower in terms of its general design.

Wind Load: The usual design wind pressure is 30 pounds per square foot of vertical exposed surface. Two formulas can be used for wind pressures on structures.

$P=0.003V^2$ for low structures

$P=0.0038V^2$ for tall structures

P =Wind pressure in pounds per square foot

V =Wind velocity in miles per hour.

Structural Design: The tower bracing and timber connection should follow such rigid standards as are presented by the major city codes and the Pacific Coast Building Officials Technical Bulletin No. 865. The United States Forest Products Laboratory furnishes design information on the use of timber in industrial structures and on the design and strength of timber connectors. The size and type of bolts, for instance, are specified.

Because of the vibrations inflicted on the structure by the fan, special care should be made concerning the vibration proofing of the connections. During times of unusual wind conditions, twisting of the frame may be encountered. The bracing alone should account for this sort of loading with any side sheathing being considered as an added factor of safety. Support of the fan assembly requires a rigidity

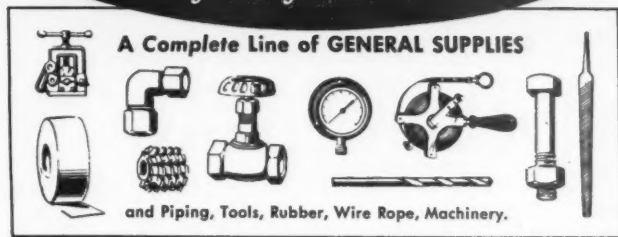
Continued on page 62



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*17% of the 222 occupational injuries which occur every hour are due to falls. Source: National Safety Council's 1949 edition of Accident Facts.

COOLING TOWERS

... begin on page 54

which will not result in misalignment of the rotating machinery.

Filling or Packing: The packing slats should have sufficient strength and be properly supported to prevent sagging. For purposes of maintenance, the filling should support a man's weight. Slat sag, or decks which become inclined or are installed slightly inclined because of poor support design will induce water channeling and greatly reduce tower performance.

Vertical Flat Slats Best

This is especially true of slats which are placed with the width horizontally such as found in the cross-flow towers. The author has experienced, in research work, an increased performance of 50 to 100% when slats were realigned from very slight inclinations. In counterflow towers where a flat slat is placed with the width vertical, such difficulties do not appear. Cross-flow towers may become progressively poorer in performance with usage for this reason.

Fans: The present use of propeller fans in the mechanical draft towers: Although a propeller fan in itself is theoretically of an axial type, one differentiates them from so-called axial flow fans in that the latter are constructed with integral sets of entrance and exit guide vanes. Guide vanes become expensive and troublesome with respect to propeller blade maintenance when the size of fans are over 8 or 10 ft. in diameter.

Fan Stack Considerations

Most fan blade shapes are not aerodynamically correct with respect to angle of pitch because of the method of construction. For the most part, the static efficiency is not much over 55%. In Kent's "Mechanical Engineering Handbook", 12th Ed., pp. 9-27, the statement is made that claimed static efficiencies over 60% should be seriously questioned. However, a properly designed propeller fan can be made which will yield a static efficiency as high as 70%.

The fan stack should be such that it will hold up under the moist and vibratory conditions. Pressed paper stacks have in some instances disintegrated under these conditions. A feasible construction is a stack fashioned from wood staves.

Reduction Gears: Some difficulties have been noted with worm gears, mainly because of tooth overloading and the poor qualities of bronze. Other

types of gears have been satisfactory. In some cases oil with a small percentage of lead naphenate has provided proper lubrication for high tooth pressures. Gear designs should be specified to follow the AGMA code for shock loading.

Motors: The motors may be either electrical, steam turbine or internal combustion engine drive. The feasibility of each type should always be considered because an economical saving may be made in some instances. For instance, where an over-abundance of natural gas is available, a natural gas engine should be used.

Electric motors have been well standardized and consultation with any reliable electric motor manufacturer will yield satisfactory results. One point is that in certain instances two speed motors are very desirable where air rates can economically be reduced at certain times of the year.

Accessories: Bolts, metal connectors, nails, etc., should be properly specified for corrosive service. Where bronze fittings are specified one should seriously consider changing to brass or galvanized iron for economical reasons.

Performance

It is difficult in most cases to properly test a tower after installation, partly because of the poor instrumentation possible and partly because the test conditions are not those given in the specifications.

In some cases towers have been operated under entirely different conditions than specified. This leads certain manufacturers to hedge slightly in their designs in order to present a particular item with good sales appeal.

One such device is lower pumping heads. A great appeal to purchasers who use large quantities of water (steam condensation in power plants, oil refineries) is to have a lower pumping head. However, experience by some operators (See "Operating Experiences in the Central Gulf Area," H. G. Hiebler, *Southern Power and Industry*, June 1951, p. 66) with low head units of about 20 ft. has been unsatisfactory and extra cells were actually needed.

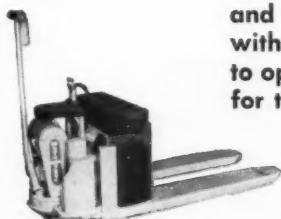
Tests and evaluation of tests will be available from the author in a brochure now being prepared. A purchaser can make use of a reliable consulting engineer with testing experience to evaluate the performances.

Cooling tower purchasing has not as yet left the era of buying by sales appeal. Few purchasers can appraise a design, much less test the final installation.

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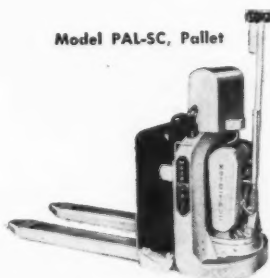
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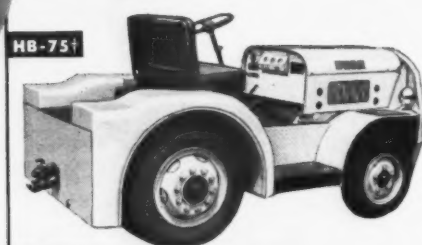
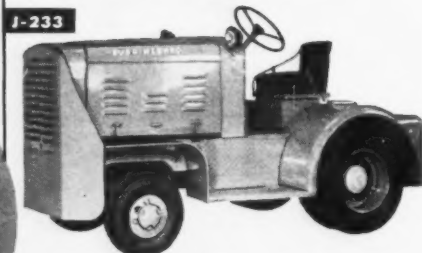
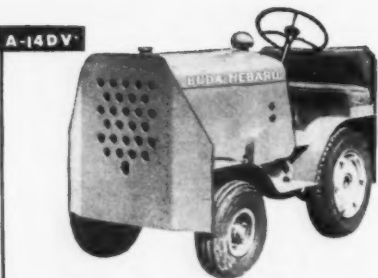


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Safety Precautions in Aircraft Fueling

FUELING AND DE-FUELING of military aircraft is actually part of the production process, since each fuel system must be calibrated before construction of the ship is considered complete.

Prior to preliminary tests, fuel cells are filled to capacity. Then after load factors are checked and fuel gauge readings are recorded, the ship must be de-fueled (pumped dry) before final adjustments can be made.

After each test flight, any remaining fuel is again removed in observance of maximum safety precautions. Thus, it may often be necessary to fill and empty the tanks several times before the ship is ready for delivery to the United States Air Force.

With aircraft assembly lines moving with clock-like regularity, specialized fueling equipment is required to keep pace with production schedules. Not only high pumping capacity, but the ability to get in and out of fueling position quickly and safely is also a major requirement for aircraft fueling trucks. At the Douglas Long Beach plant, where huge C-124 Globemasters roll off the assembly line, Richfield's White "3000" tankers supply this need.

Up front, cockpit-type vision for the operator, along with high maneuver-



A WHITE "3000", newest development in airport tank trucks, stands by with a supply of 115/145 octane gasoline.

ability (short turning radius) makes the new White "3000" particularly adaptable to these specific conditions encountered at the airport. Each truck carries 3,800 gallons of fuel in two compartments. Each compartment, with its own separate pumping system, can supply more than 125 gallons per minute.

Advance Body Works made the special-design body, with contoured back and ports instead of doors, permitting easier access to equipment and controls while eliminating hazards of windblown doors.

New Test Instruments Step Up Research



TEST CELL OPERATORS in Shell Oil Company's Martinez, Calif., refinery research program are having an easier time of it since Shell installed a battery of new control instruments. In addition, each operator can now handle an increased number of tests simultaneously and provide accurate readings in less time.

Twelve new "multiple point controllers," semi-automatic units, are

now located outside ten "cells" that contain test motors ranging in size from small, one-cylinder engines to a railroad locomotive engine and an airplane power plant. The instrumentation governs the temperature of fuels, lubricants, and cooling waters that flow into the test motors.

Shell conducts a major portion of its research program aimed at the development of better fuels and lubricants at Martinez, and according to Research Director Dr. William Bailey, has found that the new units guarantee a high degree of accuracy and reliability with appreciable savings in time, costs and labor.

The compact units are known technically as the Tag Celestray Multiple Point Indicating Potentiometer Controllers and are manufactured by the Tagliabue Instruments Division of the Weston Electrical Instrument Corporation. The installation at Martinez is one of the largest in a single location in the world.

Each of the twelve instruments has six control points and can regulate six separate motors simultaneously or actuate up to six valves or relays governing temperatures at as many different points on a single test motor.

For example, the Tag controllers can regulate the flow of additional

cooling water to engine jackets, oil heat exchangers, fuel heat exchangers and comparable equipment, or they can operate electric heaters which maintain desired temperatures.

Before the multiple point controllers were installed, technicians had to hand set desired temperatures on dials. Now temperature-governing relays are activated when the temperature at a given location in the test motors fluctuates above or below the desired temperature.

Special tests are now being undertaken on the equipment regulated by the multiple point controllers to determine the interrelation, or cross-effects, of fuels and lubricants, to discover how fast "additives" are consumed in lubricants and to find how quickly heavy duty oils are burned away in the modern automobile.

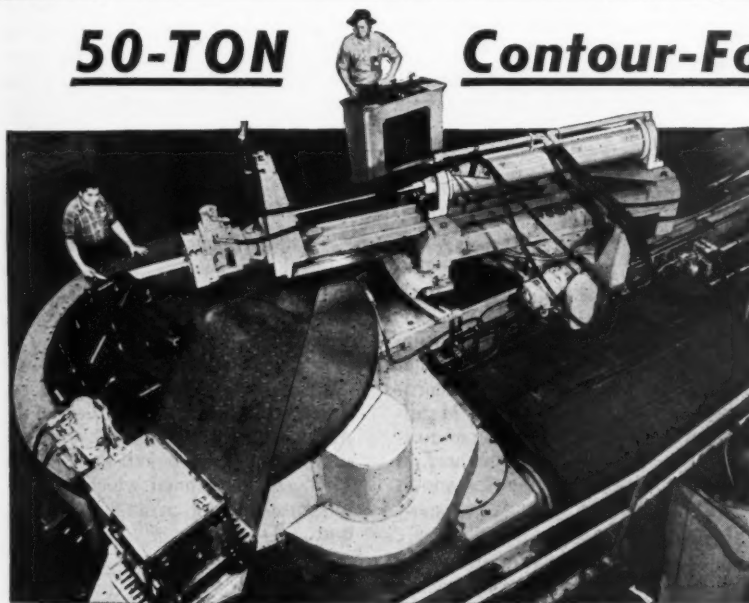
An important test now under way at the laboratory will show how heavy duty oils stand up under the wear and tear of every day use in locomotives, and another test involves the relationship between cylinder wear and gasoline octane ratings.

In addition, routine tests are being carried out continually in order to check the quality of all products produced at the Martinez Refinery of Shell Oil Company.

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AN ELECTRICAL ANALYZER for Pipeline Networks

COMPUTATION of the probable flow and pressure of water in each pipe of a pipe network system may be quite laborious. Because of this fact, studies of water distribution systems have often been hindered. A direct-reading electric analyzer is now available which eliminates all calculations beyond a simple change of scale.

The first analyzer was invented and designed by Malcolm S. McIlroy, now at Cornell University. Standard Electric Time Company undertook the manufacture and sale of the McIlroy Pipeline-Network Analyzers. The first production unit has gone to the Division of Industrial Research, State College of Washington, Pullman, Washington. There it will be available to industry and municipalities for analysis of pipe-network systems.

Previous attempts have been made to develop electrical analyzers to solve network problems, but since the volt-ampere characteristic of an ordinary resistor is very different from the nonlinear head loss-flow characteristics of a pipeline, the earlier attempts involved trial and error procedures.

The McIlroy Network Analyzer employs nonlinear resistors which represent pipelines in an analogous electrical circuit so that a rational law or acceptable empirical formula relating head loss to flow rate is properly simulated by the relation between voltage across the resistor and current through it.

Once the analogous network is set up on the electrical circuit, flow rates and pressures may be read directly from the appropriate meters. The nonlinear resistors have the general appearance of a light bulb. Intensity of light emitted from each resistor varies as the voltage (analogous to head loss) across it so that a glance at the resistor panel serves as a rapid guide in spotting portions of the network that need to be improved.

Dr. McIlroy has made a study of the accuracy of the analyzer and he has found that the accuracy is well within the limits of the accuracy of the other variables involved in a distribution system.

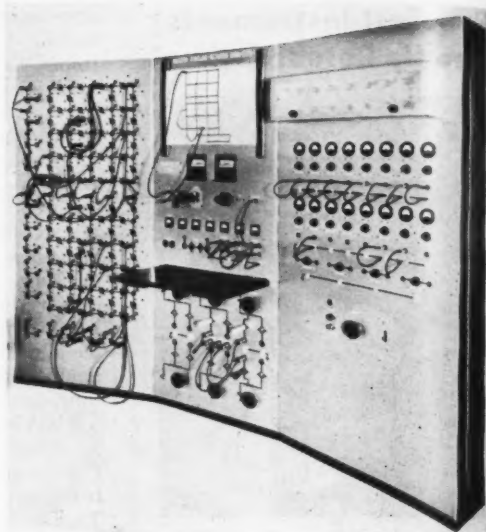
A summary of the advantages of the direct-reading analyzer are listed:

THE BRAINS of the McIlroy Network Analyzer are composed of complex circuits housed behind this control panel, upon which hydraulic pipeline networks may be simulated electrically. The first production unit is in laboratory service at Washington State College, Pullman, Washington.

1. No guesses of values of flow rates or head losses, followed by successive approximations, are involved.
2. Only those values actually needed are recorded.
3. Changes to represent alternative plans of constructing or operating a network can be made readily, and their effects quickly visualized and evaluated.
4. Solutions automatically balance with accuracy suitable for engineering work.
5. Solutions are rapid, and the probability of human error is minimized.

6. The flowing resistor filaments direct attention to parts of the network in which head losses are greatest, without the necessity of reading any instruments at any point in the actual pipeline network.
7. A network of almost any size and degree of complexity can be analyzed without any fundamental difficulty.

Inquiries about the analyzer at Washington State College should be addressed to: Division of Industrial Services, The State College of Washington, Pullman, Washington.



Western Men and Methods at First International Conference of Manufacturers

TWO San Francisco industrialists, J. D. Zellerbach and Charles L. Wheeler, are among members of the sponsoring committee for the First International Conference of Manufacturers, according to National Association of Manufacturers, which is sponsoring and directing the conference to be held in New York City, December 3, 4 and 5.

More than 200 leading Western European industrialists will be guests at this first international meeting ever held for the sole purpose of increasing productivity of free nations. Joining with them for first-hand study and exchange of production techniques will be NAM's sponsoring group, the Committee of 100 Industrialists, including Mr. Wheeler, vice president of Pope & Talbot, Inc., and Mr. Zellerbach, president of Crown Zellerbach Corporation.

Preceding the conference sessions,

to be held at New York's Hotel Pierre, the European delegates will tour United States industrial plants. Co-operating with the NAM in the program to bring together management representatives from both sides of the Atlantic are the Economic Cooperation Administration and the National Management Council, which are jointly sponsoring and arranging the plant tour.

A Correction

The name of Colorado Fuel & Iron Corporation was inadvertently omitted from the scrap metal drive article in the September issue, as one of the Western steel mills having ore facilities of its own. CF&I have been operating their own mines for many years.

Chocolate Soldier Department

THE LIGHT BROWN DISCS from which United Nations soldiers in Korea make their breakfast cocoa have a rather amazing industrial history. These vitamin-enriched chocolate pieces are processed on the machines of Gladding, McBean & Co., a Los Angeles firm that is usually engaged in making all types of ceramic products from fire bricks to fine china.

As a matter of fact, Gladding, McBean was able to fulfill an Army contract for five and one-half million units of pressed cocoa for ration kits, without factory modification. Cocoa is compressed into its disc shape on a standard hydraulic tile press, and the only change is in the shape of the dies.

Of course, the cocoa itself is not made by Gladding, McBean. It comes to them in pre-mixed powder form, in large sealed drums ready for pressing



PRESS in background squeezes cocoa under 100-ton pressure into small discs. Pressing, machine-wrapping and heat-sealing require only six workers in small space.

and packaging. Although nothing can be added to the cocoa powder to hold it together and keep it from crumbling, the finished product must be strong enough to stand moderate abuse and crumbly enough to dissolve readily in warm or cold water.

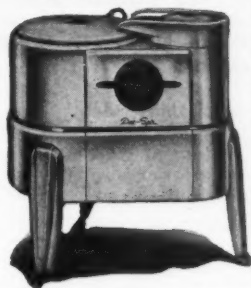
Company solved this problem by compressing the material under 100 tons of pressure. Compressed cocoa is then machine-wrapped in cellophane and heat sealed to prevent decay and loss of flavor.

The whole operation, which requires only one press and six workers, is carried out in a small corner of the main tile plant, partitioned off from the rest of the factory so that it is clean, sanitary and free from foreign matter.

Processed discs are then shipped to Fresno, where complete field ration kits are assembled and sent overseas.

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Memory Device For the Customer

IT IS ONE THING to offer customers a new special service, but it is something else to get them to use it, even in times when scarcity of materials should stimulate them to action. So Degen-Fiege Company of Los Angeles, power transmission equipment distributors, found in setting up their bearing regrounding service. The problem was solved by a device almost absurdly simple.

When they developed the idea of

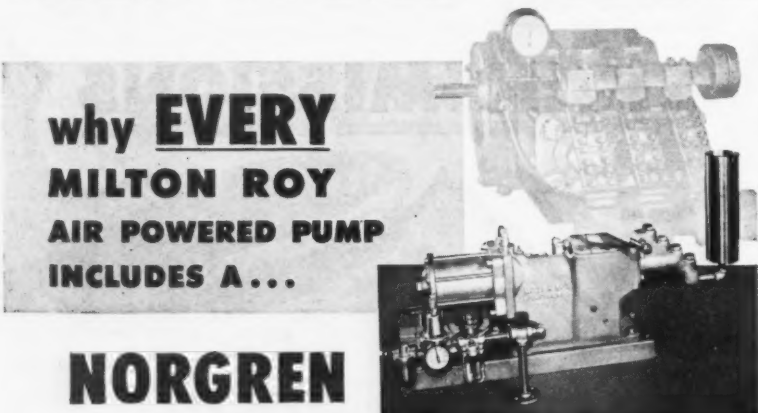
grinding used bearings, customers were informed of the "Thriftyground" service at the outset, but when the salesman called to get an order for regrounding, the used bearings were seldom to be found. If they turned up at all after a frustrating search, it was likely to be in the scrap barrel, so rusted or otherwise damaged that they could not be salvaged.

The only thing the salesman could be certain of was that the customer's intentions were good, and the answer seemed to lie in finding some method of making it easy for him to remember.

So W. C. Bremer, sales manager, devised a wire-bound box of convenient size that carried the sign "Used Bearings" in large type on the inside of the open top. Just beneath the sign he attached a packet of shipping tags, on which could be written the identification of the bearing and the service instructions, such as marking, additions of seals or shields, tolerance requirements, replacement by non-exchange ground bearing or new bearing. Also on the inside of the cover was printed an explanation of the service under the eye-catching headings "You Do This" and "We Do This."

When the box is filled, the customer merely closes and fastens the box, writes his name and order number on a tag on the outside, and the order is ready for shipment or pick-up. He does not even have to write the consignee's name and address, because it is already on the tag.

A special advantage of providing regrounding service under present conditions is the long factory production cycle on new bearings, which may require a user to wait for several months before the individual bearing he needs becomes available.



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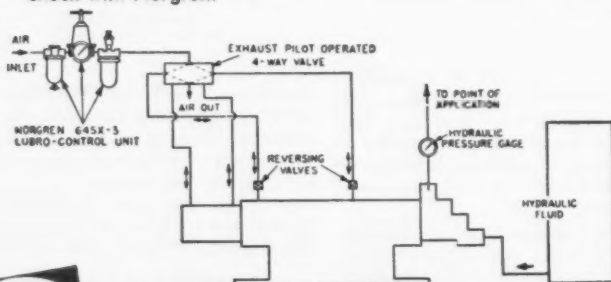
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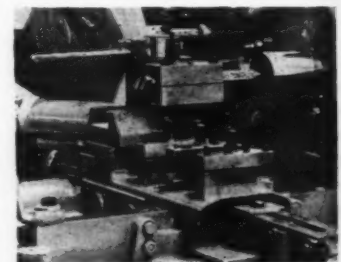


25 YEARS OF HELPING AIR POWER SERVE INDUSTRY BETTER

New Type Toolholder

MENASCO Manufacturing Co., Burbank, Calif., is representative of most Western manufacturers in that they are always eager to find industrial shortcuts while maintaining quality of product. Here, illustrated, is an example of this philosophy-in-action.

Workman is shown using a Marvic toolholder, a Western development



that was designed by people who were never satisfied with more conventional units. This toolholder, according to users with whom we have talked, is exceedingly rigid yet flexible. It has a center line adjustment (vertically) that eliminates the necessity of grinding tools to the center line.

Any lathe tool in the tool crib can be used, and the number of lathe operations that can be done at one set-up is limited only by the number of toolholders available.

PLYWOOD . . .

. . . begins on page 38

nail holes or hammer marks filled with spackle, Swedish putty or other filler. Before applying paste and muslin, the surface should be primed with a flat white oil paint. A coat of glue-size is suggested over the muslin which will then serve as an excellent foundation for any conventional paint finish.

Wear Resistance

Quite apart from uses where plywood must be finished for good appearance or to protect it against moisture changes are its applications in chutes, bins, work surfaces, carts and other jobs where weatherability and abrasion resistance are most important. This quality can be improved in Douglas fir plywood by the application of hard wearing varnishes and lacquers applied according to manufacturers' directions.

Some manufacturers are producing allied products with special surface qualities for just such requirements. One type of plastic surfaced plywood is manufactured with a plastic face particularly resistant to wear and abrasion.

Another plywood panel with special properties is available. The latter, known as Plyron, is a combination panel with a hardboard face and a plywood backbone. Hardboard gives it paintability and abrasion-resistance, plywood makes the combination panel puncture proof, strong and dimensionally stable.

End-Use Finishes

Finishes for end use products such as furniture produced all or in part from rotary cut Douglas fir plywood are too numerous to list. Often a special finish is required and made up for certain products to the manufacturer's specifications. Water-clear lacquers produce a handsome natural finish. Varnish is sometimes desirable where a darker natural finish is required and where greater grain contrast is wanted. Special baked on finishes are often used, as are the various decorative laminates for table tops, counters, etc.

Finishing information can be obtained from several sources. Douglas Fir Plywood Association, Tacoma 2, Wash., maintains a continuous program of research and testing of finishes for plywood and welcomes inquiries. Most paint manufacturers also have laboratories and technicians capable of making suitable recommendations for plywood finishes. Any paint manufacturer's representative is usually able to answer specific questions. If he can't, his manufacturer's research staff usually can.



Ford knew something was in the air!

WHEN FORD pried the lid off this box, a revolutionary new way to pack auto parts came to light. Custom was to spray bare metal surfaces with a preservative coating. Then, before parts were usable, they had to have a "hot bath." However, after months of open storage with only Angier VPI* Wrap to line this box, the uncoated parts came out shiny and clean. "No evidence of rust" said Ford's Export Division. Because VPI takes the rust-making power out of air and moisture, you know when this invisible vapor is in the air.

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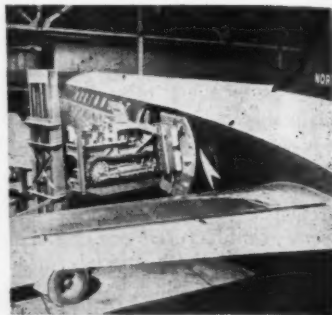
*Snap-on is the trademark of Snap-on Tools Corporation



Largest Load Lifted

A 4,300-LB. TRACTOR with tank-like treads and a shovel attachment for earthmoving, recently flown to Anchorage, Alaska, from Seattle, is recorded as the heaviest single piece of air cargo ever shipped over Northwest Airlines from the Seattle-Tacoma airport.

A special floor, braced with 4 x 4 timbers was constructed over the deck of the plane in preparation for its



4,300-LB. load moves under its own power into the plane across a track of heavy plywood.

gigantic load. After the machine arrived from Spokane by surface transport, it moved aboard the airship under its own power, across a track of heavy plywood. Tractor was lifted to plane's cargo door by a hydraulic fork lift. Planks were placed between the prongs of a 5-ton Ross lift, which served as an elevator.

Pacific Air Freight, Inc. handled the shipment.

Although this shipment was unusually heavy, NWA officials claim that it was also one of the easiest loadings to engineer, since the tractor itself really did all the work.

Pipeline Reduces Pollution 88%

IT IS ESTIMATED that salmon valued at between \$1½ and \$2 million yearly use the Snohomish River, a tributary to Puget Sound, enroute to their spawning grounds. It is known that two sulphite pulp mills are major contributors to the pollution of the bay and the Snohomish River, thereby jeopardizing the fishing industry.

Accordingly, the Washington State Pollution Control Commission issued orders to those two firms to control their river pollution. It was expected that these orders would result in the installation of recovery processes which are now available to industry.

The national emergency, however,

Interest in Foundries Is Stimulated by "Foundry Contest"

SOUTHERN CALIFORNIA Chapter of American Foundrymen's Society recently concluded its 1951 "Foundry Contest" following up the "Prize Essay Contest" of last year. This year, students of many of the neighboring Junior Colleges were again conducted through local (Los Angeles) foundries, iron, steel, and non-ferrous.

Fifty-four papers were submitted. First four prize winners were:

1. \$50.00 to Ivan Schroeder, Los Angeles Trade-Technical Junior College, for "Foundry Processes Observed at Vernon Plant of Alcoa."
2. \$35.00 to Daniel R. Lucero, East Los Angeles Junior College, for "Casting Process."
3. \$25.00 to Donald M. Evans, Glendale College, for "A Trip Through Kay-Brunner Foundry."
4. \$20.00 to Keizo Suenaga, Pasadena City College, for "Metallurgy of Cast Iron."

Quality of the papers submitted was so high that eight special prizes of \$10.00 each were awarded runners-up.

interfered with these plans, since large amounts of stainless steel necessary for the process were not available. So the Commission and the mills decided to attempt a temporary measure. At a cost of over \$650,000 the two mills installed a pipeline to carry the waste into 300 ft. of water at a point 3,000 ft. from shore and over a mile from the training dike which forms the mouth of the river.

Now, results have been obtained. They show that concentration of pulp mill liquor in the water at the mouth of the river has been reduced by 88%. Oxygen conditions which during the previous study were below the standard set by the Commission as necessary to support fish life were found to be above this standard at the time of the last study.

Juicy Fruit League

A. D. HUGHES, professor of mechanical engineering at Oregon State College, Corvallis, has constructed an 85-gallon portable aluminum pilot plant for peppermint oil distillation to be used in carrying out a \$7,500 research

program sponsored by Wrigley Chewing Gum Co., Chicago. Aluminum was used for this unit because it is more resistant than most metals to the corrosive characteristics of mint oil.

In operating this plant, Hughes has discovered that steam consumption of commercial plants can be reduced about 25 per cent and cooling water used can be cut from 40 to 50 per cent. This makes possible a saving in fuel and water costs for field distilled oil. By incorporating automatic controls on the pilot plant, labor costs can be reduced considerably.

Also improved are separation methods for mint oil and water after they are condensed in a separator. Thus, much oil that is usually lost in waste water and which pollutes rivers and streams, can be saved. This may eliminate the necessity of redistilling the waste water to reclaim all the oil. Current market price of mint oil is approximately \$6.00 a lb.

Project has already been in operation for two years. Engineering and agricultural experiment stations will make test runs in mint fields with a movable unit during next season.

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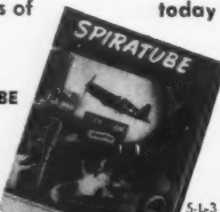
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ELECTRONICS looks WEST

for research and development

THE WORLD of electronics is looking to the West Coast to carry a full share in the national research, development and production load."

That's what Glen McDaniel, president of the national Radio Television Manufacturers Association, told the joint membership of the seventh region of the Institute of Radio Engineers and the West Coast Electronic Manufacturers Association at the recent Pacific Electronic Exhibit in San Francisco.

The West Has It

"Western achievements during World War II," said the speaker, "have aptly shown that the Pacific Coast area has the technical knowledge, the skilled help and the production facilities for the job."

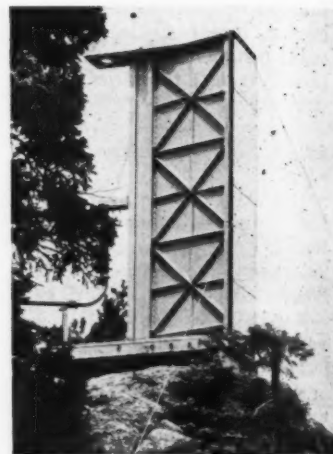
Today's students and experts point with particular pride back to the year 1906 when Dr. Lee De Forest, who recently celebrated his 78th birthday, invented the audion tube in San Francisco and immediately focused the eyes of inventors to the West Coast.

Most Significant Since 1906

What is said to be the most significant development since 1906 is likewise a Western product, the klystron tube, invented by Dr. Russell H. Varian and Sigurd F. Varian at Stanford University in 1937. It performs in the high frequency ranges almost all the functions of conventional tubes at lower frequencies. Klystron oscillators, amplifiers, modulators, demodulators and multipliers have been built, as well as klystrons of large power output.

The high-power klystron is the heart of a recent project that demonstrates clearly the production ability, as well as the research, of the West Coast electronic industry. It is the new experimental transmitter of the National Bureau of Standards, located on Cheyenne Mountain in the Rockies, which required the combined efforts of four distinctly Western organizations, founded by Westerners with Western capital and manned by Western people.

Early in 1951 the Bureau began its



ANTENNA built by Hughes Aircraft is perched on Cheyenne Mountain in the Colorado Rockies.

study of radio propagation in the troposphere for air navigation control. Specifications required extremely stable frequencies, with a five kilowatt C. W. output at about 1,000 megacycles to be operated continuously for an entire year.

Klystron, Etc., Specialists

Prime contractor for the transmitter was Varian Associates, San Carlos, California, founded in 1948 with Dr. Russell Varian as president. Although they specialize in klystrons, they are also adequately equipped for general electronic and microwave research and development and its product list includes: traveling wave tubes, microwave measuring equipment, nuclear fluxmeters, nuclear induction, spectrometers, magnets and magnet power supplies.

Subcontractors Participate

Varian Associates built and installed the klystron for the Bureau of Standards and installed it atop of Cheyenne. The frequency is stable to five parts in 100 million. Side bands due to hum modulation are very weak, and nearly the entire output is delivered in a band only 20 cycles wide.

Varian, who is a state director of the West Coast Electronic Manufacturers' Association, looked around the

field to sub-contract the rest of the government order.

Western Electronics Experts

He turned to Sierra Electronic Corp., also in San Carlos, to produce the crystal controlled radio frequency driver for the klystron. This factory, founded about two years before Varian Associates, has some 20,000 square feet of floor space and near 100 employees.

Though in this particular case the Sierra facilities on the driver were a prime consideration, the plant is highly geared for the development and manufacture of communication electronic equipments, transmitters in all frequency bands to 1,500 megacycles, receivers in all frequency bands, tunable voltmeters for 3 to 500 kc., pressure measuring equipment for aerodynamic studies and radio frequency watt meters. Paul F. Byrne, Sierra's chief engineer, is also serving a term as state president of the West Coast Electronic Manufacturers' Association and chairman of its San Francisco Council.

Varian next turned to Electro Engineering Works in Oakland. There Wally Wahlgren, co-partner, is a former president of WCEMA and Alex

W. Fry, co-partner, headed the general committee this year for the Pacific Electronic Exhibit.

Electro was given the sub-contract for the power supply. The organization was formed during World War II years and has about 100 skilled workers and over 10,000 square feet of floor area.

Its product list includes: high voltage dry type transformers, and nearly a dozen other types; filter chokes, saturable reactors, magnetic amplifiers, DC power supplies (voltage regulated, high voltage or high current, stationary or portable), electro-magnets for nuclear research and all insulated transformers to 200 kva., 500,000 volts, indoor type and many other electronic products.

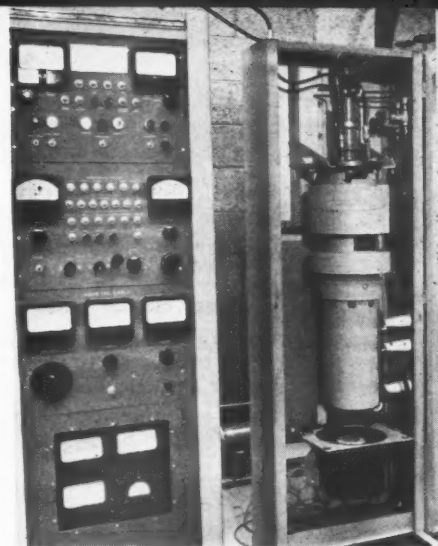
Antenna by Hughes

To Hughes Aircraft Company, in Culver City, the sub-contract for antenna was awarded. The Hughes organization, one of the new corporate members of WCEMA, employs more than 10,000 with floor space of a million and a half square feet.

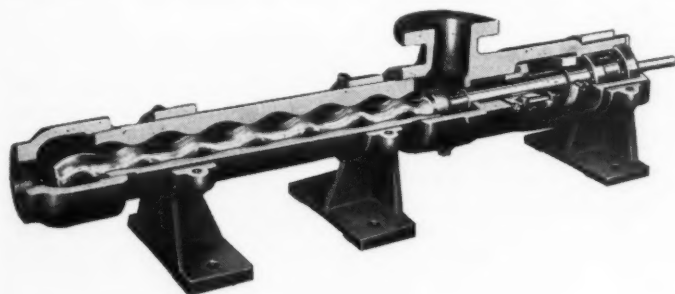
It has a comprehensive electronic division in the Culver City plant, staffed by hundreds of well qualified engineering personnel and, while the

bulk of current activity centers around the aircraft electronic field, it is also keenly interested in other types of this kind of production.

The transmitter system installed on Cheyenne Mountain, near Colorado Springs, has been operating successfully on a 14-hour daily schedule, and before the first of the year the system is expected to go into a round-the-clock operation.



THE HIGH-POWER linear amplifier klystron (right) and control panel (left).



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Users find that Moyno "progressing cavity" pumping is not only the dependable way—it's the economical way as well. Robbins & Myers Moyno Pumps are built for long life with low maintenance. It's this performance plus economy that makes owners Moyno-boosters.

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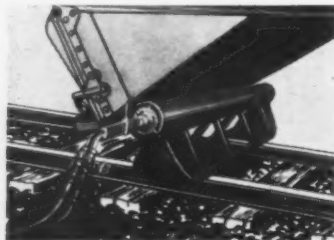
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NEW MATERIALS & EQUIPMENT

E-1101

Free and Easy on the Thaw

Features claimed: Operating this portable hopper car thawing tube equipment requires little labor. After sliding thawing tubes underneath hopper doors, lighted burner is



set in tube opening. That heats hopper and radiates heat through the frozen coal. Near end of heating period, burners can be withdrawn from tubes and used as portable torches on slopes and end of cars for a few minutes. Entire heating time requires only three-quarters to one hour, depending upon severity of freeze-up and size of car. This equipment is applicable for railroads, collieries, gas and coke plants, power plants, coal dealers and industrial plants.

Available from: Hauck Manufacturing Co.

E-1102

Built-in Coolant

Features claimed: This new 30 gallon per minute coolant unit, Model 10-10, is portable and will pump up to 12 ft. To furnish ample cooling for an eight



or ten spindle drill press. It may be used on single spindle drill press, lathe, broaching machine, cut-off machine or cutter grinders singly; or it may be changed to feed three or four different machines at the same time. A special neoprene

bearing in lower part of pump will prevent abrasives from imbedding. In upper part of pump is a specially designed ball thrust bearing and thrust collar that absorbs impeller thrust rather than transferring it to motor bearing. This self-contained unit has a 1/4 hp., 110 volt, 60 cycle motor, built-in switch. Semi-floating impeller is balanced for ef-

ficient operation. Aluminum casting pump housing is tapped for one inch pipe. Container holds 11 gallons, is 10x10x26 in., and comes complete with chip screen and sediment baffle. Neoprene hose is 3/8 in. by 6 ft. long and is equipped with shut-off flexible nozzle.

Available from: Shellback Manufacturing Co.

E-1103

For Speedy Spraying

Features claimed: Designed for high speed in hand operation spraying are two spray guns: Metco 4E for machine element work, and Metco 5E for corrosion protective



coatings. They provide near automatic operation since they incorporate a patented jet siphon principle in gas head which automatically compensates for variations in gas pressure as high as 10 lb., and provides a steady, unvarying flame which produces uniform coatings. Guns have automatic control of wire feed which compensates for kinks in wire, and reel stand drag.

They may be mounted for use on a lathe or other machine in production line work, or may be used in hand-held operation, since weight is only 4 lb., 12 oz.

Available from: Metallizing Engineering Company, Inc.

E-1104

A Good Mixer

Features claimed: Inner mixing tank of the Koven gas-fired mixer (for processing under controlled heating conditions) is 36 in. in diameter and 36 in. high, with dished bottom. It is made of 14 gauge stainless steel for atmospheric working pressure. A full jacket for 5 psi. gauge working pressure, surrounds the inner tank. Outer jacket will extend down and is flanged to form a stable base. Four ring-type gas burners are symmetrically positioned under mixing tank. They are rated at 300 cfm. and burn manufactured gas. Agitator mechanism consists of six 1 1/2 in. wide stainless steel, vertical blades equally spaced on a horizontal stainless steel tee bar. Agitator tee bar is driven by 2 hp. gear motor, through a speed reducer, at 47 rpm.

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Discharge is made through bottom of tank and is controlled by means of a horizontal long stem valve whose handle extends beyond outer shell.

Available from: L. O. Koven & Brother, Inc.

E-1105

A Staple Item

Features claimed: This tool is the first one-hand stapler capable of fastening metal or fibre shipping tags in one-fifth time needed with hammer and nails. Operator holds tag in place with one hand, then shoots staples rapidly. Heller heavy duty staples are five times normal size, and grip wood securely with a super-clinch locking feature. This stapling gun is also used for stapling shipping list protectors, linings of export boxes, fibre packing list covers, railroad box car linings, car identification tags and many other operations where speed and secure fastenings are needed.

ings of export boxes, fibre packing list covers, railroad box car linings, car identification tags and many other operations where speed and secure fastenings are needed.

Available from: The Heller Company.

E-1106

Here's a Slick Check

Features claimed: There are only three valve parts, plus seat and locking ring, in Durable check valves. They are machined and ready for immediate installation in all standard pipe fittings such as tees, elbows, crosses, and couplings. In one basic design they take the place of all other types, including swing-checks, ball-checks, clapper-checks and



November 1, 1951.

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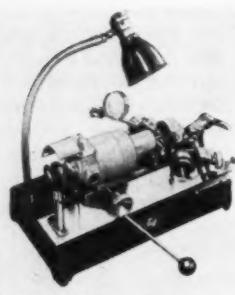
air checks. The valve member is factory lapped to the seat. Since valve continually rotates, it should need later relapping only in unusually extreme cases. For this contingency, a locking ring is embodied in design for easy take-apart operation.

Available from: Durabla Manufacturing Company.

E-1107

Grind Over Matter

Features claimed: Powered by 1/2 hp., 115-v. Dumore motor, this new drill grinder for 2-lip twist drills swings a 2 in. x 3/8 in. x 1/4 in. wheel for sharpening. An identical



wheel is mounted on other end of motor armature shaft for rough grinding broken drills to shape, together with a thinner wheel for web thinning. Standard equipment includes 1 1/2-in. collet, chuck extension drill holder for No. 52-70 drills; diamond wheel dresser and set-up gauge. Complete range of collet sizes from No. 7 to No. 1 in number sizes; .65 to 6.3 in millimeter sizes;

1/32 in. to 1/4 in. in fractional sizes; and A to E in letter sizes are available as optional equipment.

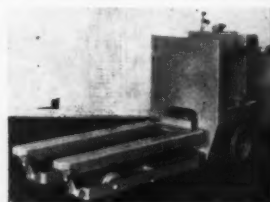
Available from: Dumore Company.

E-1108

Long Division

Features claimed: This low-lift truck is designed so that part of a load may be suspended between two sections; or a whole load may be carried as on a standard platform.

Dual purpose is achieved by dividing forward trail axle. Each of two trail wheels has a separate axle mounted in its individual frame; the frames, being reinforced, are welded to the truck body. Platforms are joined at their rear ends in a rigid structure, enabling them to be raised or lowered simultaneously as a unit. Their forward ends are connected to the wheel frames by forged steel links and platforms retract as they are raised. Platforms are formed of heavy gage steel plate with deep flanges for extra



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strength. In lowered position, flanges come down at sides of wheel frames. Platforms are $6\frac{3}{4}$ in. wide, 63 in. long, placed 14 in. apart. Lowered they are $10\frac{1}{2}$ in. above floor; raised maximum height is 15 in. These trucks are powered all-electric or gas-electric. Capacities are 2000, 4000 and 6000 lb.

Available from: Ira G. Perin Company.

E-1109

Who Blew Out the Flame

Features claimed: Advantages of this stainless steel dry chemical fire extinguisher, available in 20 and 30 lb. capacities, are its extreme light weight and maneuverability which allows operator to reach seat of fire without any lost motion. It also has a longer range than comparable models. With finger tip control, it shoots a chemical heat insulating cloud up to 20 ft., snuffing out flames on contact. Chemical used in this extinguisher produces 1100 times its volume in non-toxic, flame-killing gas on contact with flame.



Available from: Buffalo Fire Appliance Corp.

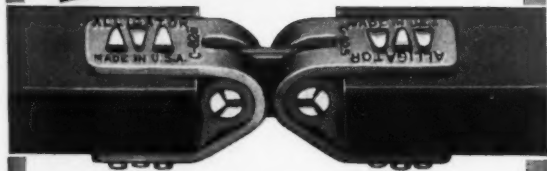
E-1110

Masquerade

Features claimed: A new dust mask for protecting workers from nuisance dusts is made of an unusual material, processed from a vegetable fibre that will not dissolve in water or live steam. Masks may be autoclaved or sterilized in boiling water. They permit free breathing and conver-

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For many years at Sohio, as well as at other oil, chemical, and processing companies, Meriam Manometers have proved thoroughly satisfactory for their specific applications. For further information on this Dual Tube Manometer development ask for Catalog Sheet M-100.

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Fernholtz Machinery Co. 8466 Melrose Place
Los Angeles 46, Calif.



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REALOCK FENCE

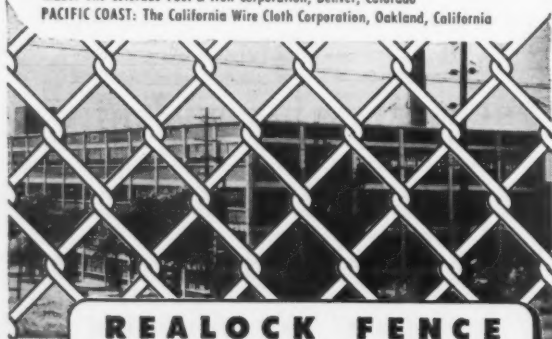
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Realock Fence provides real locked-in protection for your grounds and property. All fittings have bolts placed so that nuts are removable only from the inside...thereby insuring safety from intruders.

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PACIFIC COAST: The California Wire Cloth Corporation, Oakland, California



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sation with maximum comfort. Mask material is soft in texture, porous, absorbent and free from irritating lint or yarn. Masks are securely finished with an elastic head band and may be used many times.

Available from: General Scientific Equipment Co.

E-1111

"Temperometer"

Features claimed: The actuating element of this instrument is a bi-metallic coil, enclosed in a tube. When tube is placed directly into molten materials, such as babbitt



metal, solder or lead, heat is transmitted to the sensitive coil. This revolves in proportion to the degree of heat. A pointer attached to the end of the pointed shaft indicates the temperature on a calibrated dial. Temperometer is fabricated of stainless steel to prevent corrosion. Stem diameter is only 9/32 in., permitting use of a more scientifically designed bi-metallic coil. End of tube is closed so that solutions

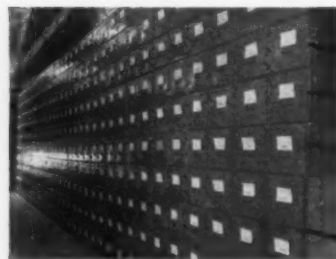
cannot enter. Dial is easy to read, and all figures are anodized to prevent fading. Comes equipped with handle so that it can be suspended over lip of a kettle.

Available from: W. C. Dillon & Co., Inc.

E-1112

Files That Make You Happy

Features claimed: These storage files are constructed from Chem-Board, a product made by chemically impregnating raw corrugated fibre-board to make it flint-hard and



rock-strong. Fully loaded Chem-Board files can be stacked to ceilings without intermediate supports. Files mate together vertically, operate freely without sagging or binding, repel vermin, can't rust, are impervious to moisture, have

positive drawer stops, and are light in weight. Files cost and weigh about 50 per cent less than steel files. They are shipped assembled ready for use, securely stitched with steel wire. They have no gum or fixtures to work loose, and do not break-down or come apart under active usage. Fourteen sizes available.

Available from: Convoy, Inc.

E-1113

Charge for the Truck Brigade

Features claimed: Sel-Rex industrial vehicle battery chargers are designed to charge lead acid or nickel alkaline batteries. They are equipped with a tandem transfer control, permitting charging of more than one battery with one setting. Control will connect charger to one battery for the present time interval and at termination of this time will automatically disconnect from first battery and connect to second battery. When last battery is charged, unit will completely shut down. AC magnetic switch, which isolates charger from input power, is equipped with automatic reset overloads. Output of charger is fused for pro-

tection against possible shorts. Extent of maintenance is cleaning rectifier plates to prevent restriction of cooling air. Units are easily cleaned with a soft brush or compressed air.

Available from: Bart-Messing Corp.

E-1114

Push Button Coloring

Features claimed: A new paint spray gun can be switched from one color to another without use of tools. It is made of lightweight, durable aluminum and has a fluid hose



connector that is self-sealing by virtue of a spring-type, ball valve set against a synthetic rubber seal. When connector is locked in place, valve is opened for use. Special rubber seal is impervious to paint, solvents or other materials used in spraying. It is designed for use with $\frac{3}{8}$ in. fluid hose. Gun completely eliminates need for

time-consuming, tool-using, gun-cleaning halts in production of painted surfaces. Ball valve is leak-proof and a bayonet principle used in locking connection provides a sure and permanent connection.

Available from: DeVilbiss Company.

E-1115

There's a New Spinning Tube in the Factory

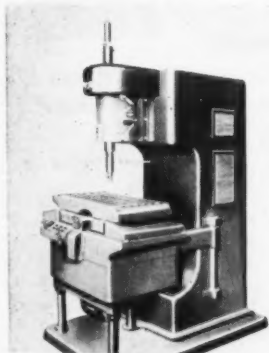
Features claimed: A plastic spinning tube, made of a tough rubber-plastic compound that will not shatter, chip or warp, will hold up to 16 per cent more yarn because yarn grips spinning tube better, thus making a tighter package. Tube needs no metal ferrules. Manufactured in standard sizes and in three colors, blue, grey and brown.

Available from: U. S. Rubber Company.

E-1116

On Tap

Features claimed: Cleveland compound-table tapping machine is designed to facilitate precision tapping of a number of same-size holes on one or more levels in bulky



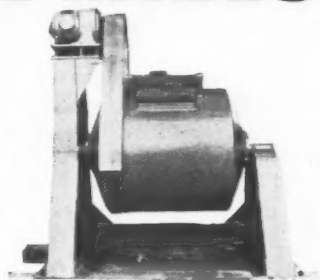
pieces where use of multiple tapping heads is not practical. Moving freely on ball-bearing raceways, the 28x42 in. work table has a lateral travel of 20 in. to either side, 13 in. forward travel and 11 in. backward travel from normal standard position. This makes it possible to center any hole in a 24x40 in. work piece directly under tap. A push-button-

controlled solenoid break locks table in any transverse and longitudinal position and holds it until released by pushing another button. Solenoid is designed so that it cannot overheat regardless of length of time brake is applied. A motor-operated raising and lowering system, controlled by "up" and "down" levers gives table 19 in. vertical travel, with table top 56 in. from floor at maximum height. Base of machine is 64 in. long and 38 in. deep. Column, 25x20

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The Clipper No. 9 Portable Lacer laces belts up to 6 inches wide in one quick, easy operation. Under powerful pressure hook legs are embedded flush with the surface of the belt and points clinched, making a perfect joint. Phone your mill supply jobber for a demonstration!

CLIPPER BELT LACER COMPANY, GRAND RAPIDS 2, MICHIGAN, U.S.A.



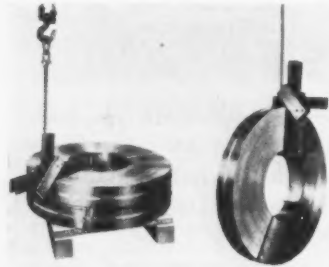
in., is 100 in. high with 26½ in. throat depth to permit handling of work pieces overhanging back of table. Top of table is precision-machined and provided with four tee slots for mounting jigs, fixtures and clamps.

Available from: The Cleveland Tapping Machine Company.

Getting Grabby

E-1117

Features claimed: In one motion an operator, using this grab, can lift coil from pallet to a vertical position. A prong tapered to fit between coils, in space made by coil bands, is positioned while opposite jaw is placed in center of coil. As crane lifts, grab automatically adjusts coil size and tapered prong slides between coils. As coil lifts, grab turns to allow coil to move to a vertical position, locked by its own weight. Grab handles coils up to 2000 lb. Larger sizes available on special order. Grab has black oxide finish and red enamel trim.



Available from: Dixon Research, Inc.

Cleaner Than Clean

E-1118

Features claimed: This high volume steam cleaning unit has two high pressure steam guns, each delivering 150 gallons per hour. In addition to its unusually large steam cleaning capacity, unit incorporates a high-pressure water



gun supplying hot or cold water at a pressure of 500 lb. per sq. in. Power blast feature of unit delivers 1,000 gallons of water per hour for blasting away accumulations of mud, muck and heavy grease. Water gun has also been found exceptionally efficient in de-icing operations. This unit is designed especially for heavy duty cleaning in industrial, maintenance, construction, petroleum, automotive, marine and railroad cleaning operations.

Available from: Kelite Products, Inc.

E-1119

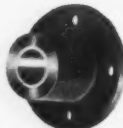
Peek-A-Boo!

Features claimed: Welders' hood can be equipped with an aluminum frame which fits on front of hood and contains a movable smoke glass, called "Quick-Lift Window." A mouthpiece is fitted into the inside of hood and welder causes smoked glass to move up and permit vision through the protective clear glass by blowing into mouthpiece. By so doing, he can change welding rod or position small pieces without swinging back his hood, and has sight of job right up to instant he strikes an arc again. To bring smoked glass

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4. LONG LIFE—Correctly lined up and properly lubricated, they last for years.

5. COMPLETE LINE—Pillow blocks with solid or split housings, and solid flanged

blocks. Grease or oil lubricated and self-oiling types.

6. CAREFULLY PACKED—All are protected to reach you in factory-finish condition. Popular sizes are shipped in convenient cartons.

7. EASILY IDENTIFIED—Recessed decals give serial number and size.

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WAY TO CLEAN METAL?

See page 11

WHAT'S THE MOST
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See page 9

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back down, welder sucks in on mouthpiece. This process can save a great deal of time and increase welder's efficiency. "Quick-Lift Window" will fit any hood and will not affect hood's flexibility.

Available from: Argyle Mfg. Co.

E-1120

Industrial Fabric

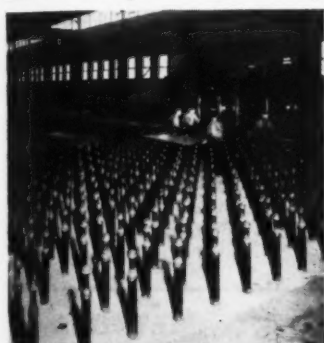
Features claimed: A new unwoven fabric called Pellon, consists of a fibre fleece bonded by a novel process. Structure permits trapping of twice the amount of air than a comparable woven wool fabric. Material does not shrink nor crease and has an almost complete power of recovery. Incorporation of fillers can easily be accomplished without interference with permeability of material. Fabric is especially appropriate when porosity and power of absorption are required features.

Available from: Pellon Corporation.

E-1121

Ball-Headed Conveyor

Features claimed: Ball transfers are designed to move objects at all angles. Boxes can be easily maneuvered about, and sheets or plates moved to any position for cutting or



or other operations. Available in five basic types. Types 101 (capacity 50 lb.) and 201A (capacity 100 lb.) are usually welded or bolted to steel plates to form a table on which materials can be moved in any direction. Types 202A (capacity 100 lb.), 501 (capacity 250 lb.) and 750 (capacity

650 lb.) are usually threaded onto end of pipe mountings. This method is ideal for handling plates or sheets around punches, presses and shears. While pipe mounting is most common use of types 202A, 501 and 750, they can also be welded or bolted to plates for handling die blocks and similar heavy loads.

Available from: Mathews Conveyor Company.

E-1122

The Better to Lift With

Features claimed: This self-contained, full-revolving steel derrick is available with either gasoline or electric power and can be swung by hand or power. It has a short

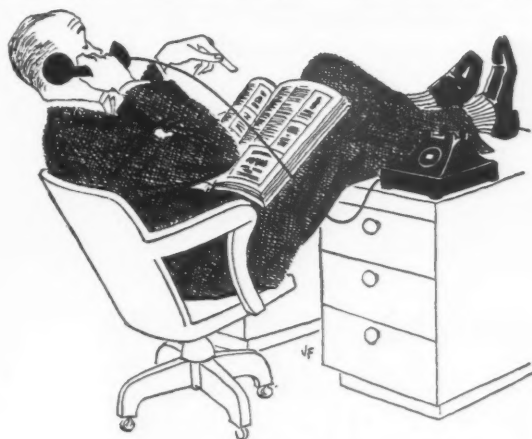


tail swing of but 5 ft., 6 in., and requires no stiff-legs or guy lines. It occupies a minimum of ground space which permits it to be set up and operate in congested areas. Rotating structure which supports boom and boom supporting members also supports hoisting machinery. This helps provide counterweight for additional stability

when swinging loads. Complete rotating structure is centered on a cast steel turntable by means of a bronze bushed center pin and is supported by four double tapered, anti-friction bearing rollers. Boom lengths of 20, 30 and 40 ft.



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Pacific Telephone

are available with load capacities from 2000 lb. at 40 ft. radius to 10,000 lb. at 10 ft. radius. Machine is particularly adapted for use at loading or unloading stations, handling materials at docks, railway terminals, lumber yards, monument works.

Available from: Clyde Iron Works, Inc.

E-1123

Sweep No More

Features claimed: This motorized floor sweeper comes in 20 and 28 in. widths. Addition of a wall brush increases sweeping width 6 in. Three types of brushes are available:



an all-purpose brush for mixed fibres; a Tampico brush for exclusive sweeping of tile, terrazzo and polished floors; and a Basine heavy-duty brush for sweeping heavy materials and rough surfaces. It is easily emptied by raising light-weight hopper, lifting it out and dumping contents. Other features include ball reel bearings,

roller wheel bearings and semi-pneumatic tires.

Available from: Parker Sweeper Co.

E-1124

Clark Clipper

Features claimed: Easier accessibility to engine compartment, new type parking brake, an instrument panel mounted on steering column, easier steering and redesign for faster maintenance are features of this "Clipper" in-

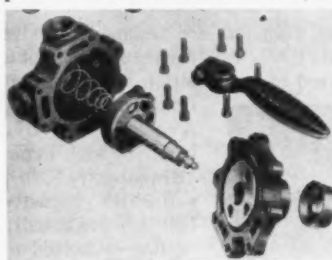
dustrial truck. To remove hood and seat to get to engine, it is necessary only to remove radiator cap and air breather cap. For access to engine for simple adjustments, louvers on both sides hinge at bottom and fold down to expose engine compartment. "No-kick-back" steering is achieved by use of axle with Elliot-type tie rods in same plane and more nearly in line with the forces they transmit, plus relocation of steering knuckles as close to the tire's dead-center shock point as is practical. Better riding is achieved through use of cushion tires on all models and rubber torsional bushings at pivot mounting points. Redesigned double cylinder tilt system gives better upright stability with a smoother, more positive control of tilt.

Available from: Clark Equipment Co.

E-1125

Valve Improvements

Features claimed: Unusual features which contribute to the long life of Hanna unitite valves include a chrome-plated stem for minimum wear; a neoprene stem collar to

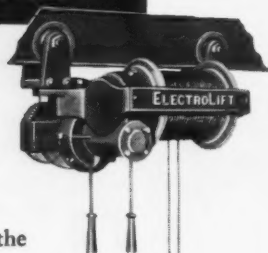


prevent abrasion from ambient dust; grease fitting at top of stem; and a lumen bronze disk. Valve handle movement is limited by internal stops to allow a 360 deg. option of handle placement for operator's convenience.

Valves are small, compact, packless and have an exterior simplicity to minimize dirt accumulation. Three mounting styles, standard, column and manifold, are available to

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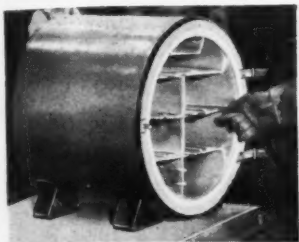
meet all requirements. Disassembly is simple since bonnet and all body parts may be removed without disturbing the piping.

Available from: Hanna Engineering Works.

E-1126

Oven Up

Features claimed: This DryRod electrode oven is a portable heated storage unit that provides control over moisture content and temperature of electrodes at their



point of use, and makes possible a system of orderly electrode control whereby assurance of better quality welds may be had. DryRod will accurately control moisture to within .2 per cent the normal accepted by U. S. Government's standard for

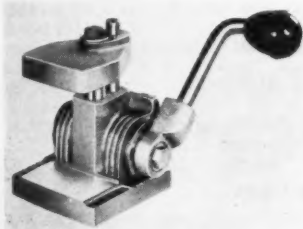
moisture content. Oven is basically a cylindrical, compartmented sheet metal unit which is heated by an 840 watt element operating off 110 or 220 volt circuits. Fully insulated, it has a low heat loss which adds to its efficiency. An important feature is the variable thermostat which gives close control on temperatures up to 600 deg. F. Dimensions are 22 in. o.d. by 25½ in. long, with capacity of 350 lb. of electrodes up to 18 in. in length.

Available from: Philip Roden Co.

E-1127

Tom Thumb Size

Features claimed: A single-post drill jig, combining small-size economy with accurate alignment and "touch-release" locking, called Mijit B-6, is recommended for



drilling small parts and for short and medium size runs, where more costly fixtures and tooling cannot be justified. Salvage is upwards of 60 per cent by changing adaptors and brushing plates, supplied from stock

by manufacturer. Locking in an infinite number of positions is positive and requires no pressure, yet releases instantly with a slight lift of locking handle. Base and top plate are accurately machined. Accurate alignment between bushing plate and base is maintained by means of a hardened and ground post and alignment dowel. Post also serves as a raising and lowering rack, with one inch stroke.

Available from: Esco Engineering Corp.

E-1128

Big Chief

Features claimed: This "Big Chief" tape ruler has ¾ in. wide blade that is 10 ft. long. Extra rigidity permits a full 10 ft. overhead extension without support for overhead and reach-in measurements. Its graduations are in jet black on white surface, bonded to the steel to make them rust and acid resistant. Ruler is graduated in feet and inches. Patented Carlson 10-second blade permits immediate replacement of accidentally damaged blades. Swing Tip allows tip to rotate to one side to permit accurate inside, butt-end and depth measurements. With its wider and longer blade "Big Chief" weighs approximately 6 oz., and its case fits neatly into pocket.

Available from: Carlson & Sullivan.



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"California's First"

After 26 years of 24 hours per day operation, and still going strong, the 4½ Lufkin Worm Gear Unit installed on Standard Oil Company's Ruhle #12 well in the prolific Baldwin Hills field, Inglewood, California, was the first Lufkin Gear put into operation in California.

Serial #16, this gear served faithfully through the period of the crash of '29, a major depression, World War II and continues to pump Standard Oil's Ruhle #12 well, 24 hours per day—still going. Maintenance on this unit has been negligible.

Of 36,000 Lufkin Oilfield Gear units produced, this is not an isolated record but it is indicative of Lufkin's life expectancy.

This is typical of Lufkin equipment not only in the oil industry, but in heavy industries everywhere—on the Pacific Coast and across America!



Checking involute and tip relief. Other laboratory apparatus such as:

X-ray; tensile testing machine; dynamic gear balancing machine; machine to check lead of helix angle.

Complete metallurgical laboratory tests insure continuous maintenance of Lufkin quality.

OFFICES Pacific Coast Headquarters and Warehouse—located in Los Angeles at 5959 S. Alameda St. Agency—Adam Hill Co., 299 Ninth St., San Francisco.

That's all for now—see you next month, same magazine, same space.

Vic Fawcett

HELPFUL LITERATURE

for the plant operator who wants to keep informed

OBTAIN YOUR FREE COPIES of valuable reference handbooks and booklets described below by writing in key numbers on postage-paid post card.

1129-L Industrial Lubricating Manual

Gray Co., Inc. makes available to you a catalog on Graco lubrication equipment for industrial bearings, standard pumps, new Mogul-type pumps, portable lubricators, lube service carts, supply pumps, hose reels, hand guns and gun loaders, and other accessories. Request copies of this catalog from Gray Co. at 141 Eleventh St., San Francisco, Calif.

1130-L Supplying Paint Guns

Gray Company, Inc., 141 Eleventh St., San Francisco, will send you an attractive two-color folder on the Graco Paintmaster which they have developed for handling paint and improving its application. Two sizes are available: one for five gallon pails, and one for 55 gallon drums. Both units fit over original containers and pump paint directly from them. Both maintain density of color and viscosity of paint at all times by means of continuous agitation. Request literature on this piece of equipment from Gray Co., at the above address.

1131-L Inside Info on Industrial Trucks

Want to see what makes an Elwell Parker electric truck operate so smoothly? Want to see its construction from the frame out? Write Ira G. Perin Co., 575 Howard St., San Francisco 6, for an interesting 12-page catalog on this subject.

1132-L Home Made Gas

"Make Your Own Gas with VapOFier" is a two-color folder published by Vapofier Corp. which describes that company's gas generator. Listed are complete specifications. Copies available upon request from Edgar Martin Co., 50 Hawthorne St., San Francisco.

1133-L Materials Handling Study

Available for one dollar from School of Management, Golden Gate College, 537 Market St., San Francisco, is a 23-page summary based upon findings of an institute on materials conducted by that school. Definition of subject, new trends, survey results and system cost summaries are among topics discussed.

1134-L Without a Nickel

"A Guide to Type 430 Stainless Steels As Alternates of the 18-8 Series," just released by Republic Steel Corp., 3100 E. 45th St., Cleveland 27, Ohio, will help those of you affected by defense restrictions on use of chromium-nickel stainless steel. Booklet describes Type 430 stainless steel and its

modifications (which contain no nickel) in comparison with types 302 and 304 (now restricted due to nickel content).

1135-L How to Choose Your Pallets

Evju Products Company, 465 California St., San Francisco, has for distribution detailed information to assist you in your choice of material and design of pallets. Also available is literature of Evju's other products such as plywood, piling, railroad ties, industrial cut stock, boat stock and frogs and switches.

1136-L The Neat Type

"Self-Cleaning Natural-Frequency Conveyors" is a booklet fully describing a new type of conveyor manufactured by Whitley-Carrier Company. The natural-frequency principle is outlined, and most models illustrated. Request copies from that company at 430 Main St., San Francisco.

1137-L The Heat's On, and Why

Importance of heat processing machines as automatically controlled precision tools in production lines is highlighted in a brochure by Selas Corporation of America, Philadelphia. Descriptions and illustrations include metal brazing, selective hardening, heating-for-forging, tinplate fusion, melting and normalizing.

1138-L Lube Lines

Oil maintenance methods for bearings of modern turbines is subject of a 14-page catalog released by Bowser, Inc., Fort Wayne 2, Ind. Factors which cause turbine oil deterioration are explained by charts, diagrams and photographs.

1139-L One for the Floor

Information on how and where to apply plastic rock flooring, as well as technical data about this product, is featured in a new eight-page brochure by United Laboratories, Inc., Cleveland, Ohio. Highlighted in this literature is use of this product for resurfacing areas subjected to heavy traffic by both foot and wheel.

1140-L Of Insulating Interest

"Foamglas Insulation for Piping and Process Equipment" is a 24-page booklet available from Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh, Pa. Brochure lists properties and typical data for cold, intermediate and hot applications. Tables in new booklet which will be of great value are those showing sizes and shapes of Foamglas available in pipe insulation, standard blocks, beveled lags, and standard curved segments, and recommended shapes and thicknesses.

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Please send me information or bulletins mentioned under the following key numbers:

Also further information on the following products advertised in this issue:

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

1141-L
Not Just a Little Bit

A two-color folder describing Thunderbolt carbide-tipped hammer bits is offered by *New England Carbide Tool Co., Inc.*, Cambridge, Mass., which tells users how efficiently these bits perform when drilling holes, under a variety of conditions, in hard concrete or granite.

1142-L
Let's Go Into the Bar

Data on size range, lengths, kind of threads, bending and types and finishes of steel bars that are furnished threaded is presented in a publication by *Joseph T. Ryerson & Son, Inc.*, Box 3817, Los Angeles 54, Calif. Also illustrated are accessories such as turnbuckles, nuts, washers and tank lugs.

1143-L
Key to the Situation

Literature on development of an improved self-leveling locking device and float-arm for its "One Man Bridge Ramp" is issued by *Elizabeth Iron Works, P. O. Box 360, Elizabeth, N. J.* Also available is a survey specification sheet which is simplified so that anyone familiar with the movement of materials handling may select correct size and type of ramp to fill requirements.

1144-L
Red Carpet

"Welcome to Jones Mills" is a 16-page, 3-color booklet by *Reynolds Metals Co.*, 2500 S. 3rd St., Louisville 1, Ky., showing how its Jones Mills, Ark., plant produces aluminum pig by electrolytic reduction process. Pictures of equipment help illustrate this process.

1145-L
All About H-2

Now available from *R. M. Hollingshead Corp.*, 830 Cooper St., Camden, N. J., is a booklet on a new non-inflammable hydraulic fluid known as H-2. History and development of H-2, as well as properties, composition and uses, are presented.

1146-L
The Apex

Believed to be the most comprehensive work of its type is a 122-page catalog published by *The Apex Machine & Tool Co.*, Dept. H, 1025 S. Patterson Blvd., Dayton, Ohio, which contains illustrations, dimensional drawings and complete specifications on more than 5,000 tools.

1147-L
Industrial "Memory Book"

Visible tip follow-up folders, which stimulate quick action in business offices are featured in a new folder by *Remington Rand, Inc.* Application and use of folders are explained.

1148-L
For Easy Come, Easy Go

Descriptive material on Lawrence steel rolling doors is now offered by *Lawrence Steel Co.*, 5746 Venice Blvd., Los Angeles 35, Calif. Photographs of typical illustrations as well as details and clearance information are included.

1149-L
Piggy Banks for Industry

A new catalog describing 39 horizontal and vertical steel money chests with round, lug-type, revolving doors is issued by *Her-*

ring-Hall-Marvin Safe Co., Hamilton, Ohio. Large illustrations and graphic drawings make it easy to understand proper application of various models.

1150-L
Tanks

The Vapor Recovery Systems Co., 2820 No. Alameda St., Compton, Calif., presents a 32-page bulletin describing an extensive series of tank equipment, gas control and safety devices for safe handling and conservation of combustible or toxic liquids and gases in petroleum, chemical, marine, food processing, paint and varnishes and other industries.

1151-L
A Good Sign

Neon Products, Inc., illuminated sign manufacturer, Lima, Ohio, has for our readers an illustrated brochure offering part of its production facilities for defense sub-contracts. Booklet shows plant layout, machine tools, personnel and shipping arrangements.

1152-L
Higher Brackets

Available upon letterhead request from *Blaw-Knox Co.*, Pittsburgh, Pa., is a handsome 95-page catalog covering a line of pipe hangers, vibration eliminators and supports.

1153-L
Down Under

Lake Shore Engineering Co., Iron Mountain, Mich., has for you a 12-page illustrated bulletin describing its complete line of flight and belt type portable conveyors and under car unloaders for handling coal, coke, sand,

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W. F. HEINE SUPPLY CO.

6005 Adeline St. Oakland 8, Calif.

Olympic 3-5500

gravel and other bulk materials. Brief specification data is given on both electric and gasoline-powered models and on hand-move and self-propelled conveyors.

1154-L

Something Concrete

A folder on Powerhouse Cement, the finishing cement that insulates, is obtainable from *Baldwin-Hill Co.*, 500 Breunig Ave., Trenton 2, N. J. Discussed therein are composition, adhesion, shrinkage, coverage, set time, workability, thermal efficiency, temperature limit and finished surface.

1155-L

Tested Tapes

Industrial Tape Corp., New Brunswick, N. J., is distributing a booklet entitled, "Government Tape Specifications" which classifies pressure-sensitive tapes according to official U. S. Government specifications. Copies free upon request.

1156-L

A Pin-up for Industry

A handy wall chart, 10½ x 16½ in., giving a complete list of standard stock sizes of flat ground die steel produced by *Simonds Saw and Steel Co.*, 470 Main St., Fitchburg, Mass., will be sent free upon request.

1157-L

Gum Binders

A new leaflet briefly describing applications of cellulose gum in the ceramic industry is issued by *Hercules Powder Company*, Wilmington, Del. Included are applications of cellulose gum as a temporary binder in white or colored sanitaryware glazes, in structural tile glazes, with a number of high-grade re-

fractories including zircon, alumina and silicon carbide; and as a glaze binder or jigger body additive in dinnerware.

1158-L

For Men of Decision

"Management by Exception," published by *Remington Rand*, 315 4th Ave., New York 10, is a pamphlet detailing that company's Kardex visible files which enable business executives to keep visual check on the pulse of business. Booklet spotlights basic features of Kardex as it is applied to production control.

1159-L

Toehold

"A Tale of Woe" by A. Toe" is title for a colorful poster on industrial foot injuries and how to prevent them, prepared by *D. W. Onan & Sons, Inc.*, Minneapolis, as a service to industrial workers. Dangers to feet and advisability of wearing protective footwear are pointed up to the reader through a series of dramatic pictures.

1160-L

From the Inside Out

Gates Engineering Co., Box 1711, New Castle, Del., offers our readers a catalog and engineering manual for its GACO rubber lined pipe joint system. Catalog illustrates how this system eliminates cost and time consuming methods in pre-engineering and pre-fabricating sections of rubber-lined pipe.

1161-L

Dews and Don'ts

Humidity conditioning equipment and its utilization by industry are related in three timely articles in the third issue of

"The Humidity Engineer," quarterly publication of *Surface Combustion Corp.*, Toledo 1, Ohio. Feature story in this issue pertains to Kathabar humidity conditioning equipment used in defense production.

1162-L

Good, Clean Belts

Stephens-Adamson Mfg. Co., Aurora, Ill., publishes Bulletin 651 on its spring-type conveyor belt cleaner. Included are diagrams and specification charts outlining how steel blades wipe conveyor belts clean and dry.

1163-L

Screen Play

Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., makes available a 20-page book on vibrating screens. Descriptive material includes specific information on how to select the right screen and screen cloth for maximum operating efficiency; dimension tables, weights, horsepower requirements and other data.

1164-L

One Dozen Cats

"Work-Horse Power" is title of a publication by *Caterpillar Tractor Co.*, Peoria, Ill., which features 12 sizes of "Cat" diesel engines and enables you power users to choose the right size unit to meet specific requirements. Booklet contains complete specifications on each engine, and available attachments.

1165-L

Sealed with Scotch

Step-by-step instructions for sealing V3 and W cartons with "Scotch" brand acetate fibre tape No. 711 to meet government

5 ways to use LOVEJOY VARIABLE SPEED PULLEYS FOR QUICK PRODUCTION CHANGES

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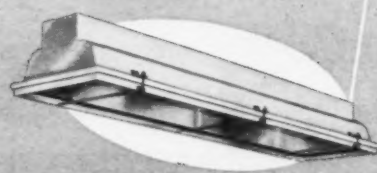
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The New D-P Seal-Lux, pictured above, is a vapor-light fluorescent luminaire built for high efficiency and rugged service life under the most exacting conditions.



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ILLUMINATION EQUIPMENT
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specifications are illustrated in a new wall chart by *Minnesota Mining and Manufacturing Co.*, 900 Fauquier St., St. Paul 6, Minn. Features and physical properties for tape are shown on back of chart.

1166-L

Built-in Weather Man

Minneapolis-Honeywell Regulator Co., Station 40, Wayne and Windrim Aves., Philadelphia, tells how its new electronic temperature measuring system decreases hazards of grain storage, in an informative manual now being distributed. Data Sheet No. 3.6-5 gives complete details of instruments and equipment used in this process.

Let's Roll

1167-L

A multi-page catalog, published by *E. W. Buschman Co.*, Cincinnati, Ohio, illustrates a complete line of portable roller and wheel conveyors, giving conveyor specifications and explaining erection problems. Twenty-eight large illustrations are provided to give you a wide range of application views.

1168-L

The Hole Story

DoAll Co., Des Plaines, Ill., makes available a 12-page descriptive folder on its twist drills, as well as its other products such as chatter-free countersinks, combined drill-countersinks, hardened and ground sleeves and sockets, and carbide tipped masonry drills. Included are charts on decimal equivalents of drill sizes, drill feeds and speeds, and tips on drill pointings and web thinning.

1169-L

Spick 'n Span

"Some Good Things to Know About Metal Cleaning," prepared by *Oakite Products, Inc.*, 1001 E. First St., Los Angeles, discusses a variety of metal soils resulting from metal-fabricating processes and the necessary cleaning methods for removing them.

1170-L

"Red" Lumber Bulletin

"Where to Use Western Red Cedar Lumber" is title of new 16-page 2-color species book, released by *West Coast Lumbermen's Association*, 1410 S.W. Morrison, Portland, Oregon, which notes the many uses of this durable wood. It contains grade use guide for most used items.

1171-L

Pioneers' Family Album

Just off the press is a brochure, celebrating the fourth anniversary of *Pioneers, Inc.*, 2411 Grove St., Oakland, Calif., makers of Battery AD-X2. Biographical sketches of firm's executives, an explanation of how mechanically sound "junk" batteries are reprocessed and numerous case histories showing applications of Battery AD-X2 are included.

1172-L

Good Contacts

Literature is now obtainable from *Ward Leonard Electric Co.*, Mount Vernon, N. Y., on its size 0 AC solenoid contactors. Described therein are such important features as multi-pole unit construction and double break silver contacts.

1173-L

Assuming a Disguise

A new bulletin describing a fast, low cost method of masking products during various stages of production is offered by *W. H. Brady Co.*, 1602 E. Spring St., Chippewa

Falls, Wis. Booklet contains photographic description of "Quik-Masks" as well as a price and stock list for this product.

1174-L

"Idle" Chatter

A manual on Rex belt conveyor idlers and machinery is published by *Chain Belt Company*, 1600 W. Bruce St., Milwaukee 4, Wis. Book contains information on all latest designs and developments of this equipment, general engineering information, and data on lubrication material and techniques.

Table Talk

1175-L

Whiting Corp., Harvey, Ill., releases a 24-page catalog on drop tables for diesel locomotives and trucks. A number of draw-

ings supplement installation views and show a variety of combinations of body supports with different types of tables.

1176-L

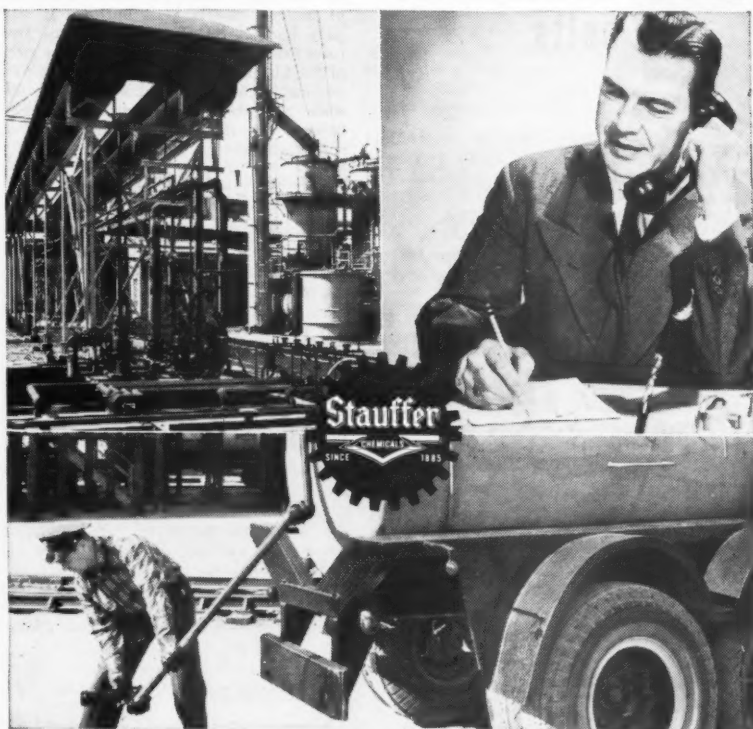
Finishing Barrels

A 55-page handbook on barrel finishing with alundum tumbling abrasive is authored by *Norton Company*, Worcester 6, Mass. A complete outline of this process is given, and booklet is illustrated throughout.

1177-L

Caustic Remarks

Of interest to all users of caustic soda is a manual just issued by *Pennsylvania Salt Manufacturing Co.*, 1000 Widener Bldg., Philadelphia, Pa. Divided into four sections under tabbed headings, booklet provides



Deal with the man who sets the wheels in motion!

When you want something extra special in chemicals—such as early delivery, modified strength, unusual packaging—its good to be able to discuss your problem with the man who can set the wheels in motion.

Here at the Stauffer Chemical Company you deal with the man who can get things done... when you want them done.

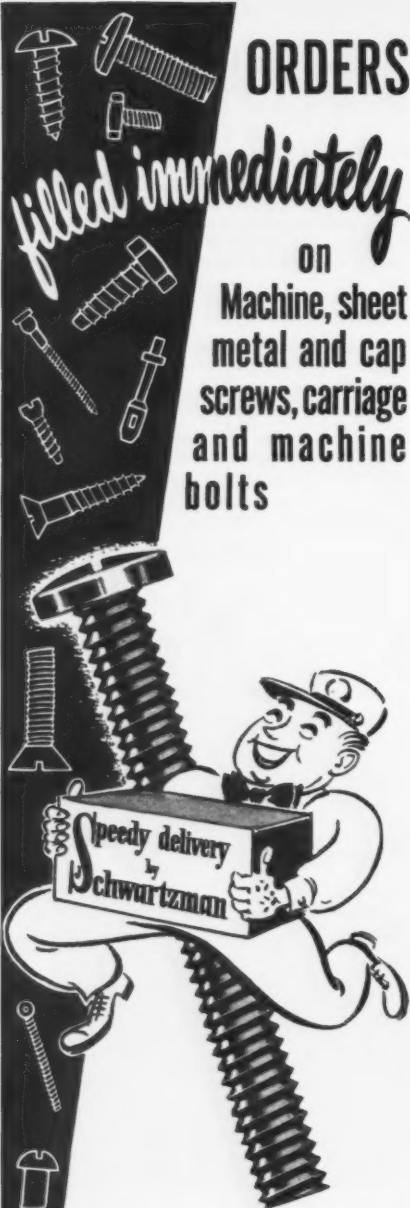
The reason is simply a basic company policy that has stood for over 60 years. Each office of the Stauffer Chemical Company and each department—industrial, agricultural, export—can give you first hand information and advice and can give you **immediate action**.

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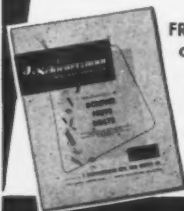
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handy reference for particular problems on purchasing, handling and storage, equipment design and technical data on this basic chemical.

1178-L Copper Corrosion Details

Nature of corrosive attack on copper and copper alloys is subject of a new report by *Anaconda Copper Mining Co.*, 25 Broadway, New York, N. Y. Publication explains chemical and physical characteristics of copper corrosion. A tabulation indicating relative corrosion resistance of principal types of copper and copper base alloys, when in contact with 183 corroding agents, is included.

1179-L For People in Glass Houses

Importance of glass block as replacement for worn-out window sash during this period of material shortages is outlined in a 16-page booklet released by *American Structural Products Co.*, Toledo, Ohio. One section of booklet is devoted to illustrations of industrial plants where glass block installations have been made, and remainder of booklet provides architectural details and specifications.

1180-L Finished Story

A complete and authentic presentation of characteristics, properties, uses and methods of application of synthetic rubber resin based coatings is contained in a brochure just issued by *Casey & Case Coating Co.*, P. O. Box 151, Maywood, Calif. Covered are machinery enamels, damp-wall enamels, stucco-masonry coatings and scuff-free floor finishes.

1181-L Blowing Bubbles

Now available from *B. F. Goodrich Co.*, 5400 East Olympic Blvd., Los Angeles, Calif., is a four-page leaflet describing new inflatable strip seal developed for bubble-type canopies of military aircraft used in high altitudes. Featured in publication are blueprints of typical seal designs, showing them both inflated and deflated, and an engineering drawing showing a typical canopy installation.

1182-L Below the Belt

A basic manual for and factual description of abrasive belt machines may be obtained from *The Porter-Cable Machine Co.*, Syracuse, N. Y. Information on each machine is complete and up-to-date.

1183-L Taps

A comprehensive, 16-page catalog on taps manufactured by *DoAll Company*, 254 North Laurel, Des Plaines, Ill., is now available. Included are illustrations and specifications on hand, machine screw, nut, pulley, pipe, tap, hook and special taps, and nine pages of technical data and suggestions for ordering taps.

1184-L And How

How to combine small units into big ones for more efficient handling, how to route materials, how to utilize "over-head" space for storage, how to use trailer trains, and how best to make use of limited manpower force are a few of the subjects discussed in a booklet, entitled "Basic Facts About Materials Handling," and published by *Clark Equipment Company, Industrial Truck Division*, Battle Creek, Michigan.

HIDUTY LIFT TRUCKS



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THE WEST ON ITS WAY

CALIFORNIA

RAND EXPANDS—Rand Corp., non-profit research firm currently doing research for U. S. Air Force, purchases eight acres of land for \$250,000 in Santa Monica. Rand will construct a two-story concrete building with 113,000 sq. ft. of floor space which will permit the 450 Rand employees, now working in scattered offices in Santa Monica, to be located in one place. Construction of the building will cost about \$1,500,000.

SWANSON GETS THE BIRD—C. A. Swanson & Sons, Omaha, Nebraska turkey packer, purchases turkey packing plant of F. K. Floden & Co., Modesto. Plant, equipped to kill and eviscerate 200,000 lb. of turkey a day, will be operated as a separate division.

HASE RAISED—Pacific Ship Repair Co., San Francisco, is awarded contract for conversion work aboard the USNS General W. F. Hase by the Military Sea Transportation Service. Bid was for \$1,287,000. The General Hase, a troop transport, will receive "trooplift alterations" which will increase her troop carrying capacity.

\$30 MILLION V-LOAN—Food Machinery and Chemical Corp. has completed negotiations for a Regulation V-Loan of \$30,000,000, through the Federal Reserve Bank of San Francisco. Funds will be used in connection with financing company's defense production for the armed forces. Eleven banks will participate in the credit, with American Trust Co. of San Francisco acting as agent.

FROM SEA TO AIR—Kaiser-Frazer Corp. receives a contract from Boeing Airplane Co. for machining parts for the Boeing B-52A airplane. Work will be done by Kaiser Manufacturing Co., Kaiser-Frazer subsidiary, at Richmond shipyard No. 2. Conversion of buildings containing 176,000 sq. ft. of floor space will cost \$6,000,000. Employment offices have been opened at the plant to handle applications for the several hundred employees needed.

HELICOPTER POWER RESEARCH—Hiller Helicopters, Palo Alto, establishes a separate division for research and development of advanced design helicopter jet engines. Facilities at the three-acre plant site, including wind generators and whirl test stands capable of producing supersonic air speeds, will handle development of helicopter jet power plants ranging from small engines for single passenger craft to engines for larger transport and troop-carrying helicopters.

TRUESDAIL ADDS TEST FACILITIES—Truesdail Laboratories, Inc., adds 2,500 sq. ft. of floor space next door to its present laboratory at 4101 North Figueroa St., Los Angeles, to handle expanded services of physical testing and environmental testing. New equipment

includes Tinius-Olsen super L model 60 universal testing machine equipped with an electronic stress-strain recorder, Rockwell hardness tester, Taber abraser, high temperature cabinet, low temperature cabinet, humidity cabinet, and sunshine and rain test equipment.

SCREW PRODUCTS CO.'S MERGE—Screw Products Corp. of America has acquired the former Pacific Screw Products Corp., 714 Olympic Blvd., Los Angeles.

LABORATORY EXPANDS—Central Scientific Co. of California has broken ground in the central manufacturing district of Los Angeles for a new 50,000 sq. ft. plant and warehouse. New structure is scheduled for completion next February. Company manufactures scientific instruments and laboratory supplies.

MORE GAS AND LIGHTS—Pacific Gas & Electric Co. plans to construct a 600,000-kilowatt steam-electric instal-

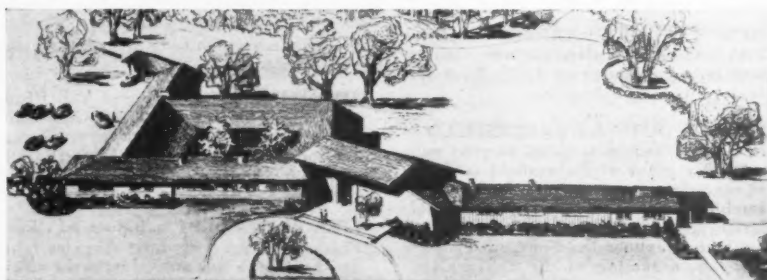
lation plant, costing \$80,000,000 on the San Joaquin River west of Pittsburg. New plant will contain four 150,000-kilowatt generating units, each larger than any in the company's system, and will be 150,000 kilowatts bigger in capacity than the Shasta and Keswick installations combined. The 230-acre site for this plant was purchased for nearly \$350,000.

VENDOLATOR IS VITAL—Vendolator Manufacturing Co., Fresno, is awarded a subcontract by Douglas Aircraft Co. to manufacture an accessory to the Ad-Skyraider, an attack plane. The contract is reported as being in excess of \$2,000,000.

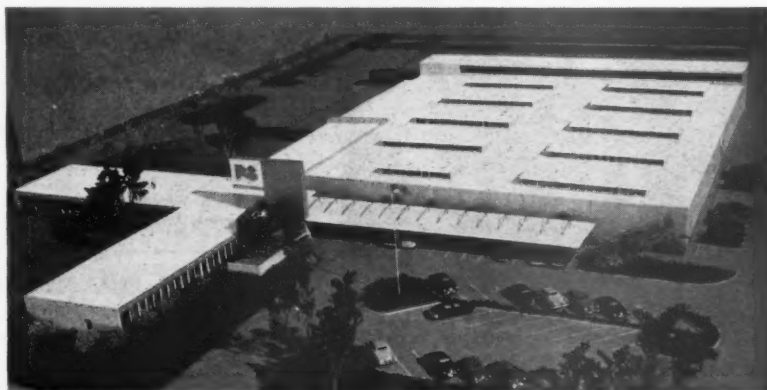
CARGO VESSEL PURCHASE—Joshua Hendy Corp., formerly California Shipbuilding Corp., has purchased three 16,000-ton deadweight carriers, C-4 type, from Luckenbach Steamship Co. for use in dry-cargo service. The ships, Marine Arrow, Marine Flyer and Marine Runner, each 525 feet long and with

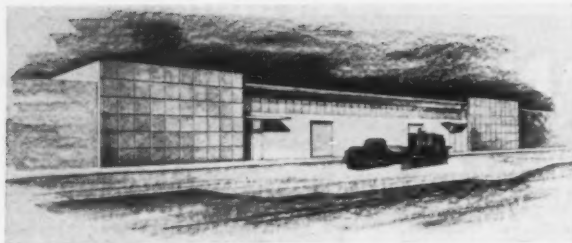
New quarters for two Northern California firms

NEW RANCH-STYLE HOME of Lane Publishing Co., publisher of Sunset Magazine and Sunset Books, is set in 7-acre garden site in Menlo Park. The \$500,000 building has 30,000 sq. ft. of floor space and features a beautifully planted patio as the heart of editorial quadrangle at left. Formally dedicated in October, these new offices typify the Western living which Lane has always promoted in its publications.

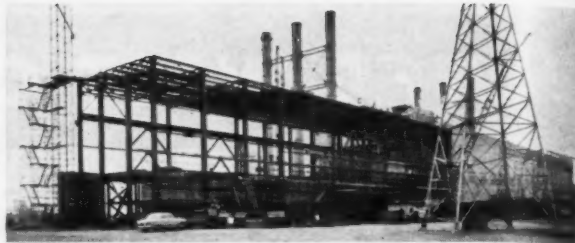


WITH COMPLETION of this new \$700,000 Northern Division headquarters at San Leandro, the Republic Supply Co. of California will stock a \$750,000 inventory of piping supplies, mechanical rubber goods, wire rope and rigging supplies, tools, equipment and heavy machinery. This is a 25% increase over the inventory carried at the former division headquarters in Emeryville. Emeryville plant and property are now up for sale.





Clearprint Paper Co. builds in Emeryville



New plant for P. G. & E. at Moss Landing

(for more details, see items below)

a maximum speed of 17 knots, will carry iron ore and bulk cargoes between the Pacific Coast and Japan. Company already has 17 tank vessels in use for the U. S. Navy.

CLEARPRINT MOVES — Clearprint Paper Co. moves into a new \$250,000 plant on 67th St., near Hollis, in Emeryville. New plant includes complete facilities for processing, handling and storing firm's paper products.

MOSS LANDING POWER PLANT—Bethlehem Pacific Coast Steel Corp. is erecting a new \$30,000,000 addition to Pacific Gas & Electric Co.'s \$50,000,000 steam generating plant at Moss Landing on Monterey Bay. Building, scheduled for completion in the fall of 1952, is 300 ft. long and 66 ft. wide and will house two 100,000-kw. generators, raising generating capacity of plant to 500,000 kw. This is enough power to supply the needs of a city the size of San Francisco. Bethlehem Pacific's Alameda Works has fabricated the approximate amount of 2,500 tons of steel being used in the turbine building and for the boiler supports.

NEW TENT FOR AARBEE—AarBee Plastic Co. moves plant and office to new and larger quarters at 4505 West Jefferson Blvd., Los Angeles.

DOUBLE DUTY AT BAKERSFIELD—Lockheed Aircraft Corp.'s new sub-assembly plant at Bakersfield is slated to manufacture several of the large assemblies for Lockheed's Super-Constellation transport. Sections to be turned out include inboard and outboard engine nacelles, a section of the aft fuselage, wing fillets and flaps, horizontal elevator, stabilizer tip and center and outboard fin assemblies.

Lockheed has also made plans to more than double the size of present facilities at Bakersfield by signing a lease with Kern Rock Co., Bakersfield, for a new building with 64,000 sq. ft. of floor space, now under construction. Two acres of unimproved property next to first building, recently acquired from Kern Rock is currently being readied for operations. This addition will make a total of 112,000 sq. ft. of factory space at Bakersfield. When both units reach their peak of operations, employment of 500 persons is expected.

WARM SPRINGS PLANT—Harbison-Walker, through a wholly owned subsidiary, is about to acquire Warm Springs plant of LaClerc Christy Co., Chicago, Ill. This permits the company to enter immediately into a wider field in the production of basic refractories and silica refractories. Up to this time the Warm Springs plant has been devoted to manufacture of tank blocks and other specialties for the glass industry.

LOVEQUIST — Lovequist Engineering Co., Los Angeles, has moved into a new building at 8737 Melrose Ave., to accommodate doubling of its production capacity for machining of precision aircraft parts.

SHOOTING HIGH—Magna Mill Products is a newly formed South Gate firm, organized to manufacture aircraft missile components. Company has a 19,000-sq. ft. plant and employs around 75 workers.

LIVE WIRE DEPT.—Industrial Wire Products Corp. of Los Angeles and San Francisco has moved its main office in Los Angeles to a new building at 5649 Alhambra Ave. New building, with 40,000 sq. ft. of floor space, is situated on

a three-acre plot and incorporates both office and warehouse space in its two stories. All materials handling, receiving and shipping will be expedited by a complete system of overhead cranes.

KIRK HILL STRETCHES OUT—Kirkhill Rubber Co. moves to a new modern office and factory in Brea. The 200,000 sq. ft. building, costing more than \$1,000,000, is situated on a 20-acre lot

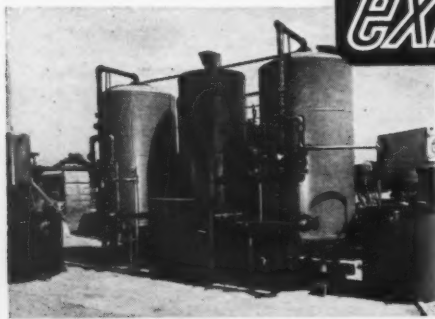


Kirkhill Rubber Company

which allows ample room for future expansion. New and larger mills, calendars, presses and tubing machines will greatly increase company's rubber products output.

NEW NAME IS AIRED—Vic Pastushin Industries, Inc., Los Angeles manufacturer of aircraft components, has changed its name to Pastushin Aviation Corp. Ownership and management remain the same.

LETTING OFF STEAM — Los Angeles Department of Water and Power has provided for a 50% increase in the city's electric generating facilities by com-



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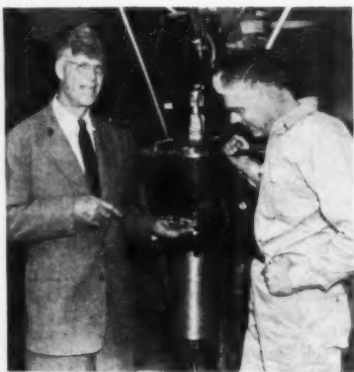
mencing construction of \$69,000,000 steam plant on a site on the east side of Tujunga Wash, north from San Fernando Road. Plant is slated to produce enough energy for the electrical requirements for a city of 1,000,000 persons, and approximately equal to power now available to the city from Hoover Dam.

IN ON THE KILN—Riverside Cement Co., San Francisco, has been granted a certificate of necessity for a \$2,700,000 addition to its Oro Grande plant. New facilities will include two additional kilns, 10 ft. in diameter and 350 ft. long, and two raw mills to produce raw materials for these kilns. Another mill will be installed in clinker grinding department. Oro Grande plant currently has three kilns of these dimensions and five smaller ones.

MANY HANDS MAKE "LIGHT" WORK—Duro-Test Corp., North Bergen, N. J., manufacturer of fluorescent and incandescent lights and fixtures, has created a West Coast subsidiary, Duro-Test of California, to take over Western business. Headquarters will be in San Francisco.

SUGAR BOWL—Stockholders of Union Sugar Co. will be asked to approve a merger plan offered by Consolidated Grocers Corp. Directors have tentatively approved the plan on a share for share exchange of stock basis. Union's land interests would be continued as a separate entity in which stockholders could retain their interest.

MILLION DOLLAR electronic research laboratory on Stanford University land results from tiny klystron tube held in the hand of Dr. Russell H. Varian (left). Varian Associates of San Carlos, Calif.



(Sigurd F. Varian at right is co-inventor of the tube) will build lab with \$1,250,000 government defense loan. The tiny klystron is used for radar, aircraft instrument landing and micro-wave communication. In background is a high-power klystron.

FILLING THE AIR—A new Air Force order calling for an additional number of B-36's has been received by Consolidated Vultee Aircraft Corp., San Diego. This undisclosed number of planes will be built at Convair's Fort Worth division. Convair also received an order from Philippine Air Lines of Manila, P. I., for three Convair liner 340 transport planes. Consolidated Vultee has been in-

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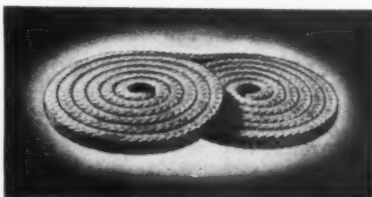
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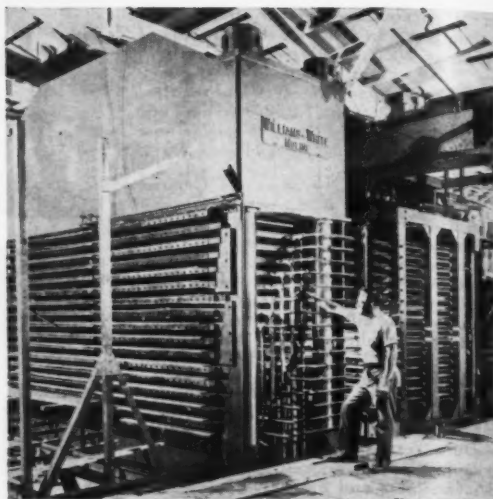


**GENERAL
APPRAISAL
COMPANY**

SEATTLE LOS ANGELES
PORTLAND SALT LAKE CITY
SAN FRANCISCO VANCOUVER, B. C.

This huge hot press for plywood was recently installed at M and M Wood Working Co. in Portland.

(see item on following page)



sued a certificate of necessity for construction of a \$2,658,000 engineering development center in San Diego. The three-story center will provide space for design engineering sections, including aerodynamics, hydrodynamics, thermodynamics, hydraulics and other groups.

AIR-O-FAN FOR SHORT—Robinson Fan Corp., Gilroy manufacturer of agricultural equipment and fans, has changed its name to Air-O-Fan Products Corp. New name describes more accurately products engineered by this firm such as, Air-O-Dusters and Air-O-Veyors.

COLOR TV CHANGES ITS SPOTS—Under an agreement with Dalmo Victor Co., San Carlos, Color Television, Inc., will manufacture \$4,000,000 worth of airborne radar and other electronic products developed by Tomlinson I. Moseley, president of Dalmo. New facilities for carrying out of this contract by Color Television, Inc., will soon be established in the San Francisco Peninsula area.

PISMO BEACH IS FERMENTING—Stauffer Chemical Company is constructing a citric acid production plant on an 85-acre site near Pismo Beach. Production process involves fermentation of molasses by a new accelerated method. Plant will consist of three principal buildings, housing air conditioned fermentation chambers, finishing facilities and seed preparation laboratories.

GLASS HOUSE—Kerr Glass Manufacturing Co. has taken on a long term lease for the eighth floor of a new 12-story office building to be built by Tishman Realty & Construction Co., Inc., at 3440 Wilshire Blvd., Los Angeles. It will house Kerr's executive offices and national sales headquarters.

SOLAR JETS AHEAD—Packard Motor Car Co. has given Solar Aircraft Co., San Diego an \$8,000,000 order for parts for the J-47 turbojet. Solar will build aft frame exhaust cone, turbine casting, transition liners, inner and outer combustion chamber lines.

SCORPION'S STING TESTED AT PALMDALE—Northrop Aircraft, Inc. will construct and operate a production flight and installation center for U. S. Air Force at Palmdale airport. Installa-

tion, consisting of a large hangar and auxiliary buildings and employing about 500 persons, will be located on Air Force property. Scorpion F-89 all-weather interceptors assembled at Northrop's main plant at Hawthorne will receive production flight testing and final installations of equipment at Palmdale. Construction of these facilities coincides with the improvement of runways and installation of expanded utility services.

COLORADO

LARGE CHARGE—Public Service Co. of Colorado has planned a construction program estimated at \$64,000,000 for remainder of 1951 and through 1953. About three-fourths of this expenditure will be used for additions to power plants and transmission and distribution facilities.

MOUNTAIN FUEL WILL EXPAND—Mountain Fuel Supply Co., Colorado, Wyoming and Utah natural gas supplier, has allocated \$6,950,000 for construction work and purchasing of property for this year and next. This amount will be divided into the following: production 48%, transmission 3%, distribution 43%, and miscellaneous 6%.

NORGREN'S NEST—C. A. Norgren Co. is scheduled to move soon from its old location at 222 Santa Fe Drive, Denver, to its new, modern plant in Englewood. For the convenience of customers, the moving period has been consolidated with the employees' two-week vacation time. No production operations or shipments will be made during that time. The new plant is more than two and a half times larger than the former plant and includes many new units of production and materials handling equipment.

NEVADA

NICER FOR NOSES—Construction has been started on Stauffer Chemical Co.'s Henderson plant. New facilities will enable the company to double its production of "high gamma" benzene hexa-

chloride, an insecticide with a less objectionable odor developed by Stauffer research and development department.

OREGON

ALBINA AWARDED—U. S. Navy awards a contract to Albina Engine & Machine Works, Portland, to build two 165-foot gasoline and oil barges for the Air Force. Barges will be 40 feet wide and 11 feet deep, with a capacity of 8,500 barrels of petroleum products. Cost will be \$276,000. Construction will begin sometime this winter when steel can be acquired.

SAWING WOOD—Portland Manufacturing Co. plans to re-open the former Portland Lumber Mill on the Willamette River in St. Johns. About 125,000 sq. ft. will be cut a day to be used mostly for export.

A PRESSING MATTER—Forest Fiber Products Co., Forest Grove, has added new equipment to its plant which will double present production of forest hardboard, an increase to exceed 2,500,000 sq. ft. per month. Equipment includes ten 5-ton plates that press 20 panels of forest hardboard in one operation, conveyors, chip handling and piling machinery, pulp-making equipment, and an outside 500-ton capacity chip storage bin.

PLYWOOD PRESS—M and M Wood Working Co., Portland, has installed at its Plylock plant what is probably the largest plywood hot press ever built in

America. Manufactured by Williams-White Co., Moline, Ill., for approximately \$70,000, the press will produce a maximum of 200,000 sq. ft. a day in panels as large as 5 x 12 ft., bonding 16 panels at a time. It is nearly two stories tall and weighs 250,000 pounds.

UTAH

BRICKS BY THE MILLION—Utah Fire Clay Co. completes \$250,000 expansion in its plant at Salt Lake City. New brick-making facilities and a 261-ft. railroad kiln, features of the expansion program, are expected to double the plant's production within a month and eventually increase output from 3,500,000 to 9,000,000 units per year.

COKE PRODUCTION STUDIED—Mineral Development Corp., in cooperation with a large New England corporation, is studying the possibility of establishing an independent coke producing operation in the Salt Lake area. Claude P. Heiner is president of the Utah corporation.

NEW SHOPS FOR UNION PACIFIC—Construction is to begin immediately on a new \$5,600,000 main diesel repair shop for Union Pacific Railroad at Salt Lake City. Building will house all modern equipment and machinery for the repair and maintenance of diesel power and gas turbine electric locomotives. Main building will be 410 ft. in length and 162 ft. wide. It will have two wings, one 220 x 102 ft., and the other 303 x

80 ft. One feature of the shop will be a 250-ton overhead crane capable of lifting the largest of diesel and gas turbine locomotives Union Pacific has.

WASHINGTON

MORE SWEEPER SPACE—Associated Wood Products of the Northwest has added more than 30,000 sq. ft. of floor space to their Seattle plant, and installed new equipment to accommodate the minesweeper construction program of the Navy. Firm is manufacturing glued laminated structural members for the ships being built on Puget Sound and in California.

LAST LOG LISTED—Rayonier, Inc., Seattle, will close down its obsolete sawmill at Hoquiam December 31st. Rather than rebuild the mill, the company decided to conserve its timber for pulp production. The 225 employees at the mill will be transferred to other Rayonier operations.

TIRE RECAPPING PLANT—Goodyear Tire & Rubber Co. has invested more than \$150,000 for a new tire recapping plant at Spokane. The building, 50 x 142 ft., one-story brick with a full basement, was acquired on a long-term lease and will be remodeled by Hanson & Parr, Spokane contractors. Approximately \$125,000 of new machinery, and some of the machinery being used in Goodyear's present location, will be installed at the new plant. About 20 persons are expected to be employed.

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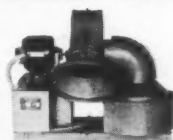
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WESTERNERS AT WORK

Arizona

PROF. JOHN C. PARK appointed dean of the College of Engineering, *University of Arizona*, Tucson, succeeding Dr. G. M. BUTLER, retired, and accepts appointment on a temporary basis.

California

HAROLD L. ACKER named head of newly-formed aeronautical finishes department at Los Angeles for *General Paint Corp.*



Werolin

ROY E. CREWS appointed Pacific Coast District transportation supervisor for the engineering and sales department, *Westinghouse Electric Corp.* W. C. LANDIS, vice president, appointed general manager of the

ALF E. WEROLIN, former managing partner of *McKinsey & Co.*, elected vice president in charge of administration and planning for *National Motor Bearing Co., Inc.*

air brake division of *Westinghouse Air Brake Co.* at the Emeryville plant.

CHARLES DURHAM appointed administrative manager of *Kyle & Co.*, shipbuilding division, at Stockton. Durham formerly worked on Kyle's jobbing operations in San Joaquin Valley and the Bay Area.



Durham



Johnson

Ampex Electric Corp., Redwood City, appoints HARRISON JOHNSON manager of the newly created product engineering division.

WILLIAM D. DOBSON elected executive vice president and CHARLES G. TODD vice president of *General Milk Co.*, foreign affiliate of *Carnation Co.* Dobson was former assistant vice president and general sales manager of *Carnation's* fresh milk and ice cream divi-

sion. Todd was *Carnation's* assistant secretary. MARK A. MATTHEWS, assistant general manager of *Carnation's* Los Angeles milk plant, succeeds Dobson as general sales manager.

H. V. HUGHES appointed manager of industrial division of *Southwestern Engineering Co.*

HOWARD M. DASCHBACH named general traffic manager of *Consolidated Western Steel Corp.*, San Francisco. Daschbach continues as general traffic manager of *Columbia Steel Co.*, San Francisco, and *Geneva Steel Co.*, Utah, both U. S. Steel subsidiaries.

WILLIAM P. B. MARKS elected vice president and secretary of *Kaiser Aluminum & Chemical Corp.* Marks is also vice president in charge of the legal department of *Henry J. Kaiser Co.*

Sacramento Northern Railway appoints HAROLD J. MULFORD acting superintendent of transportation, succeeding STACEY S. LONG, retired.

Standard Products Co.'s West Coast division, Long Beach, names WILBUR C. NORDSTROM general manager, succeeding LAWRENCE B. BLYTHE. Nordstrom transfers from *Standard's* administration offices in Cleveland, Ohio, where he headed the military division. Blythe takes over as coordinator of all channel and weatherstripping operations, including sales, in Cleveland.



Nordstrom

B. R. BONDREN elected secretary-treasurer of *Menasco Manufacturing Co.*, Burbank.

ROBERT T. HARCUS, executive vice president and general manager of *International Cementers, Inc.*, a division of *Byron Jackson Co.*, named assistant to the president. JOHN B. MERRITT, general manager of the *Patterson-Ballagh* division, becomes general manager of *International Cementers, Inc.* JAMES T. WORKMAN, assistant to the president, named assistant to the general manager of the *Patterson-Ballagh* division.

JAMES A. CROOKS appointed manager of commercial research for *Bethlehem Pacific Coast Steel Co.*, succeeding O. P. WALKER, resigned. Crooks was a sales representative in the San Francisco district sales office.

Standard Oil Co. of California appoints C. A. POLLARD general manager of its El Segundo refinery succeeding E. E. LYNN, retired. Other personnel changes include: J. T. HIGGINS, formerly assistant manager, operations control division, San Francisco, becomes manager of operations, Richmond refinery; J. A. HAPKE, formerly superintendent, light oil division, El Segundo refinery, becomes manager, service divisions at that plant; C. D. LEWIS, assistant superintendent, package and utilities division, El Segundo plant, succeeds Hapke; and M. F. MILLER, formerly manager of construction, Barber, N. J., refinery of *California Refining*

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TRADE MARK



Co., a Standard Oil subsidiary, succeeds Higgens at Richmond.

JOHN M. ROGERS, former vice president of military sales, *Douglas Aircraft Co.*, Santa Monica, appointed assistant to president, *Marquardt Aircraft Co.*, Los Angeles.

A. A. RORISON, formerly comptroller, elected vice president, secretary-treasurer of *Vic Pastushin Industries, Inc.*, Los Angeles. CHARLES W. DEMAREST promoted from chief tool design engineer to superintendent, tool design and tool fabrication. JOSEPH H. MOORE advanced to project superintendent in charge of experimental work.

California Packing Corp. names P. STEELE LABAGH, former assistant department manager, as traffic director succeeding IRVING F. LYONS, deceased.

JAMES H. DEAN, assistant to president, *Gladding McBean & Co.*, resigns to head his own engineering representation firm, *Empire Engineering Co.*, Pasadena.

Lockheed Aircraft Corp. transfers FRED TRYGG, Burbank, to manage the new Bakersfield plant.

F. E. CADDY, former superintendent of *Shell Chemical Corp.*'s Houston, Texas, plant, appointed manager of that company's Martinez plant succeeding O. M. WILLIAMS, now assistant to vice president in charge of manufacturing in New York.

JOHN A. MCCONE, formerly undersecretary of the Air Force, resumes position as chairman of *Pacific Far East Line, Inc.*, and president of *Joshua Hendy Corp.*

GABRIEL J. TICOLAT appointed *Defense Production Administration*'s deputy administrator for international problems, on leave from his position as vice president of *Crown Zellerbach Corp.*, San Francisco.

Consolidated Vultee Aircraft Corp., San Diego division, promotes R. C. LOOMIS, formerly head of quality control and production flying operations, to manager of the B-36 program. P. M. PROPHETT, test pilot, promoted to manager of flight, and G. A. COVINGTON, former chief of inspection, promoted to manager of quality control.

F. A. MENKEN appointed vice president of *Tide Water Associated Oil Co.*, and manager of exploration of the Western division, succeeding L. C. DECIUS, retired.

Colorado

C. A. Norgren Co., Denver, promotes JAMES A. MOODY to material control man-



Moody



Hall

ager and WILLIAM O. HALL to chief project and test engineer.

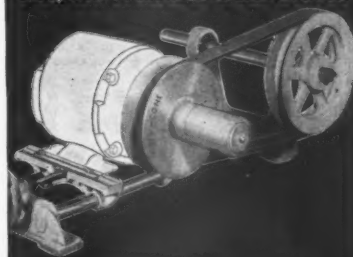
Nevada

SETH R. WOODRUFF, JR. appointed field manager of the Nevada test site field office

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New Mexico

RALPH P. JOHNSON appointed Los Alamos field manager for the Atomic Energy Commission. MILTON A. REX becomes staff assistant for test operations for manager of Santa Fe operations.

R. G. HAWORTH, assistant resident manager of Potash Co. of America, Carlsbad, promoted to resident manager succeeding P. S. DUNN. Dunn is currently in California with American Potash and Chemical Corp.

NELSON C. WHITE, former assistant manager of International Minerals & Chemicals Corp. Carlsbad plant, named general manager of the Potash Division and vice president of Innis, Speiden & Co., recently purchased by International.

Oregon

E. ROBERT DE LUCCIA, chief engineer of Yale hydro-electric project under construction, elected vice president by Pacific Power & Light Co., Portland. H. W. MILLAY promoted to secretary succeeding J. G. HAWKINS. Hawkins will act as assistant secretary until his retirement.

WILLIAM P. FOSTER and JAMES D. CARNAY appointed to the executive committee of Lumbermen's Industrial Relations Committee, Inc., in the capacity of labor relations advisors.

CHARLES E. CRAIG, sales engineer for Pope & Talbot, Inc., Portland, appointed assistant manager of creosoting department.



Craig



Johnson

ALLEN G. OWEN promoted to the newly created position of Western division service manager covering all of the United States and Canada west of the Rockies and Alaska for Hyster Co., Portland. JAMES LEPP advances to manager of the parts order department, also a newly created position.

Utah

DR. JAMES BOYD, who resigned as director of the U. S. Bureau of Mines, joins Kennecott Copper Corporation's executive staff.

Washington

HARRY JOHNSON re-enters food processing business after two years' absence to become manager of Seattle operation of Cedargreen

Frozen Pack Corp., succeeding DICK N. SOUTH, who resigns.

Boeing Airplane Co., Seattle division, names H. S. BIRRELL, former assistant to division superintendent of tool fabrication, assistant labor relations manager succeeding FRED HULEEN. Huleen is appointed industrial relations assistant. BERT AXMAN, former experimental plant engineer, named plant engineer. JOHN DEAN succeeds Axman.

Port of Seattle promotes COL. WARREN D. LAMPORT from general manager to managing director, and GEORGE T. TREADWELL from chief engineer to general manager and chief engineer.



Moffitt

THOMAS E. MOFFITT appointed works manager at Tacoma plant of Hooker Electrochemical Co., succeeding JOHN D. RUE, retired. Other promotions at Tacoma include: GEORGE GENTES to plant engineer, succeeding HOWARD D. NORRIS, retired; EDWIN A. ADAMS to purchasing agent; CHESTER D. ROBERTS to traffic manager, succeeding CARL A. STEWART, retired, and RUSSELL HANSEN to master mechanic, succeeding ANDREW H. HANSEN, retired.

B. NEVING CLUNE, formerly in charge of the Seattle office of industrial services division, Washington State College, becomes industrial relations director, Seattle Chamber of Commerce.

H. F. MILLS, formerly general superintendent of Grandview operations at Metline Falls for American Zinc, Lead & Smelting Co., becomes Northwest explorations engineer.

ASSOCIATIONS ELECT

Society of Industrial Designers, Pacific Coast Chapter: chairman, CHARLES CRUIK, Los Angeles, Calif.



Wilson

National Association of Refrigerated Warehouses, Inc., South Pacific Chapter: chairman, MILLARD W. YOUNG, vice president and general manager, National Ice and Cold Storage Co., San Francisco, Calif.

California Manufacturers Association: President, WILLIAM A. DERIDDER, chairman, General Metals Corporation; vice-president, RALPH M. HOFFMAN, president, Link-Bell Company, Pacific Division; secretary, GEORGE S. WHEATON, vice-president, Eston Chemicals, Inc.; treasurer, R. K. CUTLER, president, Cutter Laboratories, Inc.

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Potter & Rayfield, Inc., Atlanta, Ga., appoint Tri-State Supply Corp., of Los Angeles and San Francisco, as factory representatives for California, Arizona and Nevada.

Those smiles and the handshake came about when W. C. BREMER, sales manager of the Degen-Fiege Co. (left) and H. E. VAN BEVERS, district representative of the Lubri-



Bremer Van Bevers

plate Division of Fisk Brothers Refining Co., cinched the deal whereby Degen-Fiege Co. now handles Lubriplate on a distributor basis, throughout Southern California and Arizona. Degen-Fiege Co., at 1733 E. 15th St., Los Angeles, handles power transmission equipment, of which Lubriplate is an essential factor. Lines and products now handled by Degen-Fiege include: bearings, Fafnir Bearing Co., Bower Roller Bearing Co.; chains and sprockets, Diamond Chain Co.; packing, Raybestos-Manhattan, Inc.; V-drives, Browning Mfg. Co.; hose and belt, Raybestos-Manhattan, Inc.; cotton belt, Victor Balata & Textile Belting Co.; leather belt, Alexander Bros. Div. of Armour & Co.; electric tools, Thor Independent Pneumatic Tool Co.; proto tools, Plomb Tool Co.

JOSEPH J. STALL is promoted to manager of Pacific Mutual Life Insurance Co.'s group insurance office, Los Angeles. Stall, acting manager in Los Angeles since August, will direct Pacific Mutual's offices in San Diego and in Phoenix, Arizona.

American Air Filter Co., Inc., opens a new branch office at 6175 York Blvd., Los Angeles 42, Calif. Office incorporates dust control division and engine and compressor division. RICHARD V. SLOAN is manager of this new operation.

S. L. NEELY appointed sales manager for San Francisco division, Eastman Tag & Label Co. Neely joined company in 1945.

W. D. VINCENT joins General Electric's Seattle, Wash., engineering staff as an application engineer, Apparatus Division.

United States Plywood Corp. appoints DONALD L. BRALEY manager of the newly built Los Angeles distribution warehouse unit at 4480 Pacific Blvd. JACK KAEFER, former salesman, succeeds Braley as San

Francisco manager. New warehouse contains a 60,000-sq. ft. storage area, a 6,000-sq. ft. office, showroom and sales room center, and a 30,000-sq. ft. paved area for customer parking.

W. D. O'MORROW named sales manager of Alsynite Co. of America, San Diego, Calif. O'Morrow formerly worked for Crane Co. and Electric Steel Foundry Co.

Noland Paper Co., Inc., opens a new branch and warehouse at 7 Front St., San Francisco, Calif. The main office is located at 736 La Cienega Blvd., Los Angeles. FRANK GUERENA is appointed district manager for new branch.

Electrical Communications, Inc., San Francisco, manufacturer of secode selectors and associated equipment, names C. R. Strassner Co., Los Angeles, as representative.

Lincoln Engineering Co. of California elects L. L. MEIKLE president, succeeding HOMER C. REDD, who remains with the company in an advisory capacity. In his new position, Meikle supervises West Coast division which consists of Arizona, California, Nevada, Oregon, Washington and western Idaho. Lincoln Engineering Co. moves its Los Angeles sales and service office from



Lincoln's new offices in Berkeley (top) and Los Angeles (bottom) are modern and functional.

421-23 E. Washington Blvd. to a new building at 2844 S. Grand Ave., corner of 30th St. The Northern California branch moves from 2850 Broadway, Oakland, to 3033 San Pablo Ave., Berkeley.

WILLIS C. CARPENTER is appointed sales supervisor of Pennsalt of Washington's B-K and household products department in the Western area with headquarters at Los Angeles, Calif. Carpenter was formerly sales representative for Pennsalt in Arizona, Nevada and Southern California.

RAYMOND G. RUSSELL, Pacific Coast vice president of the Cyclone Fence Division, American Steel & Wire Co., retires after 40 years of service. CARL A. TEN HOOPEN, Sr.,

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At Ziegler Steel Service opening. Phil Champion (left), Mrs. Herbert Ziegler, Lynn Stevens, Narice Fergate, and Herb Ziegler.

(for details on "warehouse warming" see item below)

assistant general sales manager, Cyclone Fence Division, appointed to Pacific Coast manager of sales.

EDWARD BURKE named authorized sales representative for C. A. Norgren Co., Denver, Colo., to handle Norgren line of pneumatic products in Northern California. He succeeds STIRLING F. LAMOND, deceased. At present, Burke heads *The Burke Co.*, San Francisco, Norgren headquarters for Monterey, Kings, Tulare and Inyo counties.



Burke

Ziegler Steel Service Co., headed up by HERBERT ZIEGLER, opened their new Northern California establishment at 727 66th Ave., Oakland, on October 10th with a "warehouse warming" attended by a large number of people from industrial plants. The Ziegler organization, which began operations in Los Angeles six years ago, extended their activities to the northern part of the state two years ago, but soon outgrew their first facilities on Union St. The new quarters in the heart of the fastest-growing industrial section of the East Bay have 10,000 sq. ft. of floor space, with additional property which will permit more than doubling the present capacity in the future. Equipment includes a 5-ton crane and a 3/16 10-foot shear. A complete stock of sheet, strip, bar and tinplate, covering both hot rolled and cold rolled products, low carbon and high carbon and alloys will be carried. PHILLIP S. CHAMPION is the Northern Division manager. Also newly established by Ziegler is an office and warehouse at 310 W. Third St. in Wichita, Kansas.

Chain Belt Co. appoints *Cate Equipment Co.*, 49 East Ninth South, Salt Lake City, Utah, new district sales office in Salt Lake area.

A new 100 x 111-foot warehouse providing expanded facilities for servicing the Pacific Northwest, is being constructed for *Chain Belt Co.* in Portland, Ore. This new warehouse will also contain company's Portland district sales office.

The White Motor Co., Pacific Coast region, promotes HOWARD STROTHER, former wholesale manager for White's Southern California, Arizona and Utah territories, to sales manager, Pacific Coast wholesale divi-

sion at San Francisco. KENNETH STROTHER, formerly with the San Francisco sales office, succeeds his brother, Howard, in Los Angeles office.

A. D. GRIFFIN appointed engineer and representative by *Kennametal, Inc.*, in the San Francisco district; and CONRAD SEIM takes over similar position in Southern California and Arizona district.

Globe Steel Tubes Co., Milwaukee, Wis., names *Smith Pipe & Steel Co.*, Phoenix, Ariz., a new distributor for complete Globe line of welding fittings.

Hamilton Hall Mfg. Co., Milwaukee, Wis., appoints *J. T. Hill Sales Co.*, Los Angeles, Calif., Southern California and Arizona representative.



Woolley

Pacific Scientific Co. appoints A. C. WOOLLEY as San Francisco office manager, industrial division. Woolley will direct sales and service activities in central California area.

Harry Cornelius Co., 1510 North 2nd St., Albuquerque, N. Mex., named a distributor for *Weatherhead Co.*, Cleveland, Ohio, handling the complete brass fittings line, reusable steel hose ends and industrial hose.

Lovejoy Flexible Coupling Co., Chicago, Illinois, appoints *Edward L. Parsons*, 600 16th St., Oakland, Calif., and *Transmission Products Co.*, 6912 Santa Fe Ave., Huntington Park, California, representatives to handle Lovejoy products.

B. F. GROCAN, formerly sales manager of *California Container Corp.*'s folding carton division, Oakland, Calif., joins the *Klibb Corp.* as sales director, with headquarters in New York City.

Link-Belt Co. opens a new factory branch store at 108 South Fourth St., Salt Lake City. New branch is headed by DONALD W. NEWSOME, district manager, an engineer transferred from the San Francisco plant. Assisting will be HARRY HOTCHKISS, until recently on the staff of the Spokane branch. This office will serve mines, mills and factories in Utah, southern Idaho and eastern Nevada.

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THE LARGEST PHOTO REPRODUCTION PLANT IN THE WEST

The Jervis B. Webb Co., conveyor engineers and manufacturers, opens a new factory at 2650 East Washington Blvd., Los Angeles, Calif., under the name of *The Jervis B. Webb Co. of California*. The new plant



Interior view of new Jervis B. Webb factory in Los Angeles.

will serve California, Oregon, Washington, Idaho, Wyoming, Nevada, Arizona and Utah. Officers of the new corporation are: president, JERVIS C. WEBB; vice president and general manager, PAUL R. KUHN; chief engineer and secretary, ERIC O. MELMER, and treasurer, E. W. MCCAUL.

RALPH H. COCKROFT appointed Western sales manager for *Flexible Tubing Corp.*, Guilford, Conn. Cockroft headquarters at 416 Citizens Bank Building, Pasadena, Calif.



Cockroft

STEPHEN SMITH, *Republic Supply Co. of California*, Los Angeles, promoted to manager of operations, will also continue as Southern region stores manager covering Southern California.

Carpenter Steel Co. names RANSFORD V. MANN, JR. as Los Angeles district sales representative, Alloy Tube Division.

The *Howe Scale Co.*, Rutland, Vt., appoints LYND E. GRANT manager of Los Angeles, Calif., branch. Grant continues as San Francisco branch manager, with WILLIAM J. TUCEY recently appointed assistant branch

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manager. Howe's Los Angeles office covers sales and service in Southern California, Arizona, western New Mexico and El Paso region of Texas.

The *Osborn Manufacturing Co.*, Cleveland Ohio, appoints *Inesco, Inc.*, exclusive representative in California for its line of foundry moulding equipment. President of the newly formed company is OTTO H. ROSENTERER.

Gilmore Steel & Supply Co. moves from Swan Island, Portland, Ore., to new warehouse and offices at 6161 N.W. 61st Ave., Portland.

McKinsey & Co. transfers H. R. LAND from San Francisco to the Los Angeles office. Also transferred to Los Angeles are T. C. PALMER and J. O. VANCE from the New York office, and F. C. CHAPMAN from Boston.

Petko Industries, Inc., formerly distributor for *Mulex, Inc.*, has consolidated with that company and will operate under the name

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of *Petko Hardware Co.* New company will occupy same quarters as its predecessor at 1107-09 East 8th St., Los Angeles 21, Calif.

Sonnet Supply Co., 580 North Prairie Ave., Hawthorne, Calif., appointed West Coast distributor for *Gorham Tool Co.*, Detroit, Mich., and will handle complete line of Gorham standard cutting tools and associated products.

T. L. HARP appointed assistant manager, Tramway Division of *Columbia Steel Co.*, San Francisco. JOSEPH N. KEMPLE succeeds Harp as product manager, Wire Rope and Electrical Wire Products Division.

DON W. LYON, San Francisco district sales manager for *Libbey-Owens-Ford Glass Co.*, named manager of textile sales at the new fiber glass division, Toledo, Ohio.

New facilities of *J. W. Minder Chain and Gear Co.* now occupy a full block on the west side of Central Ave. between 60th and 61st Streets, Los Angeles, in the center of industrial activity. A private spur track provides easy rail access. Offices, warehouse, and manufacturing facilities occupy about 52,000 sq. ft. of floor space, steel storage and fabricating take up 8,000 sq. ft., and 10,500 sq. ft. are provided for parking and truck loading. Principal products manufactured by J. W. Minder Chain and Gear Co. are gears and sprocket wheels for all types of drive and conveyor chains. Minder also represents leading manufacturers of power transmission equipment, such as: Dodge Manufacturing Corp., Morse Chain Co., Moline Malleable Iron Co., Ohio Gear Co., Thermoid Rubber Co., and others, whose products are carried in stock.



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Johnston Stainless Welding Rods

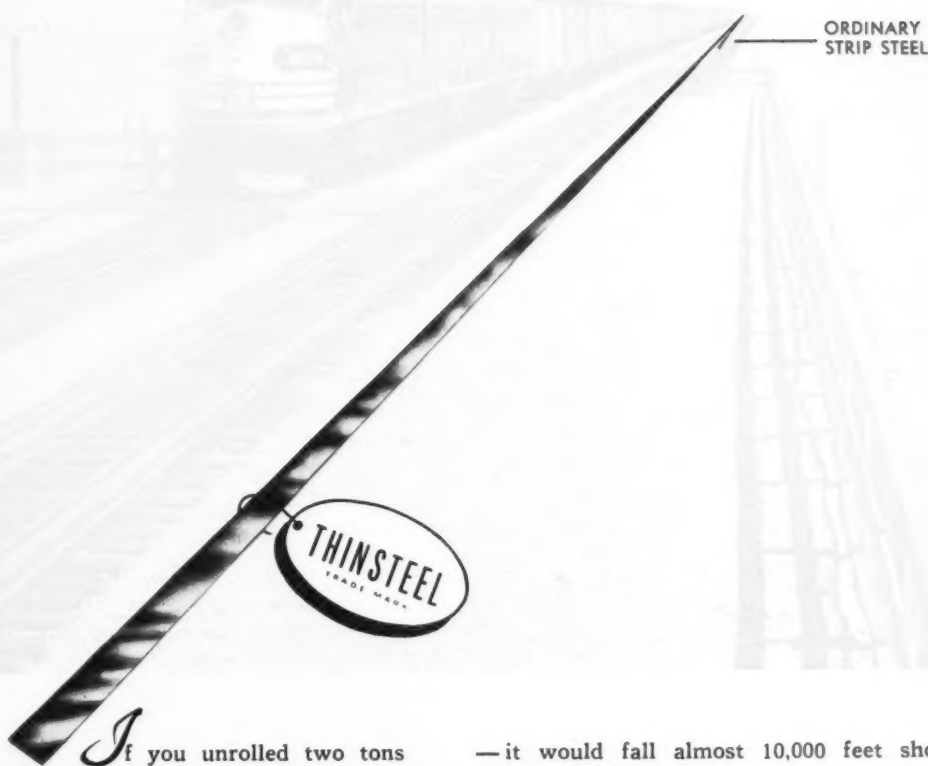
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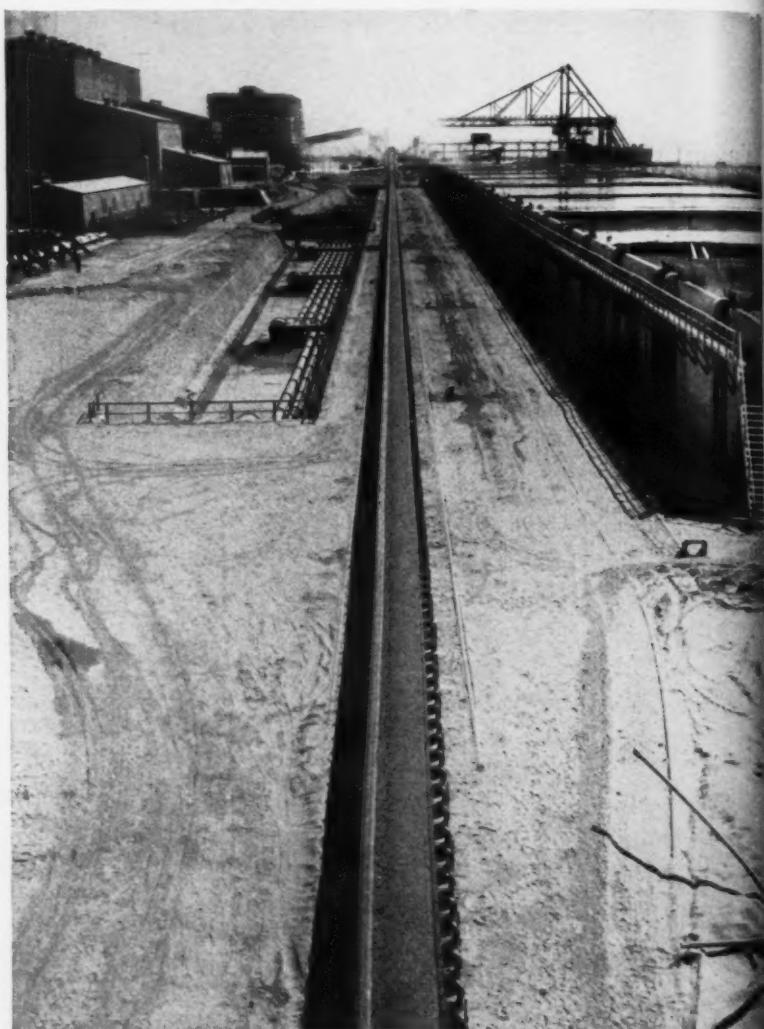
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